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THE JOURNAL

OF THE

American Medical Association

Subscription, $7.00 | PUBLISHED WEEKLY | Single Copies, 25 Cents

VOLUME 106, No. 24

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535 North Dearborn Street, Chicago, Ill.

JUNE 13, 1936

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THE JOURNAL of the American Medical Association is published weekly by the American Medical Association, 535 North Dearborn Street, Chicago, Ill. Subscription price, $7.00 a year. 25c a copy. Canadian $8.50. Foreign $11.00. Entered as second class matter June 25, 1885, at the Postoffice at Chicago, Ill., under Act of March 3, 1879

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The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 106, NO. 24 — JUNE 13, 1936

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CHICAGO, ILLINOIS

FACTORS OF RESISTANCE IN EXPERIMENTAL POLIOMYELITIS

WITH COMMENTS ON IMMUNITY IN POLIOMYELITIS

N. PAUL HUDSON, PH.D., M.D.
COLUMBUS, OHIO
EDWIN H. LENNETTE, PH.D.
AND
FRANCIS B. GORDON, PH.D.
CHICAGO

The question of immunity in acute anterior poliomyelitis has remained a challenging problem in virus studies. Investigations conducted since the early work of Landsteiner and Popper and of Flexner and his associates have attempted to solve the difficult situation, but experimental medicine has not as yet placed in the hands of the clinician and public health official effective tools capable of preventing or specifically treating this condition. Attempts to devise methods of immunization have been too numerous to recount, but generally the procedures have not been sufficiently effective and safe in the experimental disease for proper application to man. The noncultivability of the infectious agent on lifeless mediums and the availability of only a single, expensive experimental animal have been practical deterrents, but the basic difficulties have been more recently appreciated; namely, the peculiar pathogenesis of the disease and specifically the tendency of the virus to follow neural pathways. Efforts to induce an immunity in man have been based on classic principles effective in other infectious states, and insufficient attention has been paid to the basic difficulties and to factors of the host's resistance to this particular virus.

For the past five years we have carried on an experimental study of the factors concerned in resistance to and pathogenesis of poliomyelitis in Macaca mulatta (Macacus rhesus). An analysis and correlation of the observations have led to an evaluation of certain elements that are concerned in immunity to experimental poliomyelitis. The value of such observations with respect to the human disease depends on whether the factors operative in the disease of monkeys may validly be applied to the condition in man. On the basis of these analytic studies and ancillary observations we have attempted to explain the observed facts in terms of immunity in poliomyelitis.

A reconstruction of our experimental procedures allows a logical consideration of possible factors of resistance under the following headings: the nasopharyngeal mucosa, the intestinal mucosa, the spleen as a large depot of reticulo-endothelial cells, the demonstrable antibodies in the blood serum, certain bodily physiologic factors, the relationship between the blood and the central nervous system, and the rôle of the olfactory tract. In such a survey the external barriers, certain anatomic and physiologic elements, and some essential relationships of the nervous system are considered.

From the Department of Bacteriology, Ohio State University, and the Department of Hygiene and Bacteriology, University of Chicago.

The experimental work was supported by grants from the International Committee for the Study of Infantile Paralysis and from the Rockefeller Foundation to the University of Chicago.

EXPERIMENTAL

The Nasopharyngeal Mucosa.—The epidemiology of poliomyelitis points to the nasopharynx as the common portal of entry of the virus. Experimental evidence for this was on hand as early as 1910, when Flexner and Lewis [1] showed that monkeys could be infected by applying the virus to this region. Later reports by various workers have emphasized the significance of the olfactory nerve endings in the nasal mucosa as the probable anatomic structures by which the virus enters the body. There appears, however, to be some resistance offered by the mucosal barrier in monkeys, since even relatively large and repeated doses of virus are not always effective in infecting animals. This is further borne out by the observation by Schultz and Gebhardt [2] that a preliminary flushing of the nasopharynx with acid phosphate solution reduces the resistance to virus administered intranasally.

This observation we have confirmed by noting that, without the previous washing with acid phosphate, we obtained poliomyelitis in sixteen of twenty-four monkeys, whereas all of nine monkeys succumbed to the disease after we adopted the technic of washing with the acid solution, and in fact with the use of less amounts of virus than previously. (These animals do not include those in which some other experimental factor was introduced.)

Clearly, the monkey's nasal mucosa offers a barrier of resistance to infection, possibly by the presence of mucus overlying the terminal hairs of the olfactory nerves. The action of the acid phosphate presumably is to digest the mucus and to flush the mucosa. The presence of an alterable barrier in this site is further indicated by the finding of Armstrong and Harrison [3] and of Sabin, Olitsky and Cox [4] that the effect of alum applied to monkeys' nasopharyngeal mucosa is to increase the resistance of the animal to virus given by this route.

1. Flexner, Simon, and Lewis, P. A.: Experimental Epidemic Poliomyelitis in Monkeys, J. A. M. A. **54**: 1140 (April 2) 1910.

2. Schultz, E. W., and Gebhardt, L. P.: Observations on the Intranasal Route of Infection in Experimental Poliomyelitis, Proc. Soc. Exper. Biol. & Med. **30**: 1010-1012 (May) 1933.

3. Armstrong, Charles, and Harrison, W. T.: Prevention of Intranasally Inoculated Poliomyelitis of Monkeys by Instillation of Alum into the Nostrils, Pub. Health Rep. **50**: 725-730 (May 31) 1935.

4. Sabin, A. B.; Olitsky, P. K., and Cox, H. R.: Protective Action of Certain Chemicals Against Infection with Poliomyelitis Virus by the Nasal Route, Proc. 37th Annual Meeting, Soc. Am. Bact., New York, Dec. 26-28, 1935, J. Bact. **31**: 35-36 (Jan.) 1936.

The Intestinal Mucosa.—The gastro-intestinal tract has been suspected on epidemiologic grounds of being the route of infection in man. Positive experimental results have been obtained only when some extreme measure was resorted to, and then not regularly. Lennette and Hudson [5] and Flexner [6] have recently reviewed the situation and reported their failures to elicit any experimental support for gastro-intestinal infection. We [5] attempted to infect monkeys by administering large amounts of virus to isolated intestinal loops, thus bringing the virus to mucosa presumably normal physiologically and devoid of the effect of dilution by intestinal contents. Our experiments were entirely negative, which may be explicable on the basis of lack of exposure of unmedullated nerve fibers in the intestinal mucosa or for the reason that regions of intestine optimal for virus invasion were not used. From these experiments it appears that in the monkey the intestinal mucosa is a distinct barrier to infection.

The Spleen.—Much work has been done to show the rôle of the spleen in infectious processes. It is not our intention to review here the evidence bearing on the activity of the organ as a large accumulation of reticuloendothelial cells. That this system is active in the disposal of infectious agents and is probably an important factor in immunity is now generally recognized.

Whether the spleen could be a factor of resistance in experimental poliomyelitis depends in large part on whether the virus circulates in the blood vascular system. This has seldom been demonstrated in the experimental animal and for that reason we did not at first attempt to gain information on the immunologic activity of the spleen following intranasal or intracerebral inoculation. Furthermore, either of these methods of inoculation is so effective that a large series of animals would be necessary to gain reliable data on the susceptibility effect of removing the spleen. On the other hand, intravenous inoculation of virus is effective only when large doses are administered, and by employing a subinfective dose any lowered resistance obtained by splenectomy might be apparent. The present summary of experimentation by Lennette [7] is concerned chiefly with the effect of removal of the spleen before and after intravenous injection of virus.

When large amounts of virus were given intravenously to normal animal controls, half the monkeys (nine of eighteen) became infected, while the same proportion of monkeys (four of nine) died of poliomyelitis that were similarly injected after healed splenectomy. Of fourteen immunized and convalescent animals without spleens, none succumbed to the same treatment. When smaller doses of virus, however, were administered to six normal monkeys as controls, none showed any reaction, whereas two of five monkeys previously splenectomized had the specific infection. This was the only evidence that splenectomy played any part in lowering the resistance of the experimental animal to intravenously injected virus. A further examination of the rôle of the spleen was made by removing it from one to five days after inoculation of virus intravenously. None of six monkeys so treated became infected by doses of virus subinfective for normal (intact) animals.

The question of whether the spleen takes up the virus after intravenous inoculation was approached by testing for virus in spleens removed one, three and five days after vascular injection of nonparalyzing doses. Twelve monkeys (six normal, three convalescent and three immunized), each group distributed as to time of splenectomy, were operated on. The virus was recovered from the spleens of only the two normal animals splenectomized twenty-four hours after virus injection.

This rapid disappearance of the virus in active form in the spleen was again demonstrated by its recovery from the spleen only one day (two monkeys) and not three and five days (two monkeys each time) after intrasplenic injection of potent virus. Is the virus, under these conditions, destroyed by phagocytosis or neutralized by antibodies?

An explanation was sought by examining the spleens of monkeys in an acute stage of poliomyelitis following cerebral inoculation of virus. The virus was not demonstrated in three spleens not perfused but was detected in extracts of perfused spleens of two other monkeys examined. Apparently, the spleen contained the virus, whether intravenously or cerebrally inoculated, and the virus was not recoverable later than twenty-four hours after vascular injection because of some other factor, possibly the neutralizing effect of antibodies. This hypothesis was tested by first examining splenic extracts of immune and normal monkeys for a neutralizing property; both of two spleens of the former neutralized virus, whereas neither of two of the latter had a neutralizing effect. This property associated with immune spleens was, however, apparently dependent on the contained blood of the spleen, since the neutralizing property was not demonstrable in the tissue of perfused spleens from three animals dying of poliomyelitis, three immune monkeys and three normal controls. We do not overlook, however, the possibility of there being too little tissue antibodies to be experimentally demonstrable.

It thus appears, under the conditions of these experiments, that there is some reason to consider the spleen as a factor of resistance in experimental poliomyelitis, even though minor. Splenectomy previous to intravenous virus seemed to lower the resistance to infection in a certain proportion of animals. The virus was taken up by the spleen in some way but rapidly disappeared as active virus, whether by its intracellular destruction or neutralization by antibodies. Perfusion of spleens removed the neutralizing property, which indicates its absence or small amount in splenic cells and makes uncertain the site of antibody formation in experimental poliomyelitis.

Circulating Antibodies.—The neutralizing antibody is the only form of immune body demonstrable in poliomyelitis. Its significance is debatable. Jungeblut and Engle [8] propose that it may be considered, under certain circumstances, as nonspecific. It has not regularly been demonstrated in the serum of persons convalescent from poliomyelitis; Kolmer and Rule [9] have recently summarized such observations. Furthermore, the neutralizing property is not always present in the serum of immune or convalescent monkeys. The experience of various workers in this regard has been brought together by Gordon.[10]

5. Lennette, E. H., and Hudson, N. P.: Failure to Infect Monkeys with Poliomyelitis Virus Through Isolated Intestinal Loops, J. Infect. Dis. **58**: 10-14 (Jan.-Feb.) 1936.

6. Flexner, Simon: Respiratory versus Gastro-Intestinal Infection in Poliomyelitis, J. Exper. Med. **63**: 209-226 (Feb.) 1936.

7. Lennette, E. H.: Studies on the Spleen in Experimental Poliomyelitis, to be published.

8. Jungeblut, C. W., and Engle, E. T.: Resistance to Poliomyelitis, J. A. M. A. **99**: 2091-2096 (Dec. 17) 1932.

9. Kolmer, J. A., and Rule, Anna M.: Tests for Immunity to Acute Anterior Poliomyelitis: I. The Technic and Status of the Monkey Serum-Neutralization or Antiviral Test: J. Immunol. **29**: 175-189 (Sept.) 1935.

10. Gordon, F. B.: Active and Passive Immunity in Experimental Poliomyelitis, to be published.

We (Hudson and Lennette [11]) have been unable to find any experimental evidence that alters our point of view that the neutralization test in man and monkey is a specific antigen-antibody reaction. We agree, however, that it may not always be demonstrable in the presence of an immunity that has been called tissue resistance.

On the other hand, experimental work by Gordon [10] leads us to propose that its presence in monkey serum is not evidence that an effective resistance to infection exists in that animal. Gordon has "vaccinated" twenty monkeys with various preparations and found twelve of nineteen of them (one test animal died of an intercurrent infection) to have a serum neutralizing property. When virus was instilled intranasally, however, eighteen of the twenty animals died of poliomyelitis, and a nineteenth succumbed following a subsequent intracerebral inoculation. One concedes that the test of resistance was experimentally severe, but the intranasal route may be adjudged more natural and less severe than the traumatizing cerebral method of inoculation. Evidently, the mere presence of a serum neutralizing property in the monkey cannot be considered as direct evidence of complete resistance to intranasal infection. The explanation probably lies in the pathogenesis of the disease, in that an extreme measure of immunization is necessary to protect the nerve cells against virus invasion. An immunization that leads solely to the production of antibodies may not be sufficiently intensive to confer an effective protection on the cells essentially parasitized.

Physiologic Factors of Menstruation and Maturation.—The immunity enjoyed by an individual to a certain infectious disease is entirely understandable when it follows recovery from a recognizable attack. Difficulties are met, however, in attempting to explain the resistance shown when no specific definable experience has been observed. Direct evidence is at hand in some cases, such as diphtheria, indicating that inapparent attacks account for much of one's resistance to specific disease. This may be the case in poliomyelitis; but, in the absence of a cultivable infectious agent, it is difficult to identify all the steps in the process of immunization. Aycock [12] uses the term "autarcesis" to explain the inapparent bases of resistance, and he correlates such a condition with the physiologic state as influenced by environmental factors. Jungeblut and Engle [13] propose that variations in the susceptibility to poliomyelitis can be traced to physiologic alterations attendant on such factors as maturation of the individual and changes in endocrine activity. They present experimental evidence to indicate that menstruation as an endocrine function and maturation as a physiologic development both lead to resistance to infection and to the presence of nonspecific neutralizing antibodies in the serum.

The hypothesis of the influence of menstruation has been tested by Hudson, Lennette and King,[14] who found that artificial menstruation induced in ten young monkeys by injections of anterior pituitary extracts failed to lead to a development of neutralizing serum antibodies or to a demonstrable resistance in the nine animals injected with virus. Similarly, we [11] were unable to detect antibodies in thirty-one serum samples from fifteen adult males and six adult females (one specimen gave a positive test once and a negative test later). Criteria for the adulthood of these animals were as follows: The dentition of the animals was either early permanent (four monkeys) or completely permanent (seventeen monkeys); the testes were fully descended or menstruation had been observed over long periods; the heights were from 63 to 84 cm. and the weights were from 3.2 to 11 Kg. In these experiments we did not find evidence supporting the view that menstruation as such and sexual maturation are factors in the resistance to experimental poliomyelitis.

The problem of the conditions that influence resistance and susceptibility to infectious disease is of extreme importance and should be approached from as many angles as is experimentally possible. It is entirely conceivable that endocrine functions influence the outcome of exposure of the host to the parasite, but before such can be accepted in poliomyelitis, the experimental evidence should be consistent and continuous.

The Blood-Central Nervous System Relationship.—We have presented evidence bearing on the parts played in the defense to experimental poliomyelitis by the nasopharyngeal and intestinal mucosa, the spleen, humoral antibodies and certain physiologic factors. What of the central nervous system itself and its relation to the remainder of the experimental animal?

The attention is called to the nervous system in poliomyelitis by the essential pathologic condition therein and by the experimental work from 1912 to 1934 (reviewed by Lennette and Hudson [15]) that first incriminated the olfactory tracts and then proved the neural pathway of the virus from the nasal mucosa to the spinal cord. We [15] confirmed the observation of other workers that sectioning the olfactory tracts in the monkey prevented infection after intranasal instillation of virus. A further experience was recorded of being unable to infect the same five animals by massive intravenous doses, whereas four of five monkeys with intact olfactory tracts succumbed to the same intravenous dosages. This apparently essential rôle of the nerve pathways under these conditions was made more significant by our recovery of the virus from nasopharyngeal washings pooled from a group of three normal monkeys fatally infected with intravenous virus.

These experiments emphasize the selectivity of the virus for nervous tissue and suggest, without proving, a mode of infection after intravenous administration of virus. To circumscribe this relation between the virus and the nervous system, Lennette and Hudson [16] explored the possibility of the effectiveness of the blood-central nervous system barrier as a factor of resistance to vascular virus. A sublethal dosage of virus by this route was established and then, borrowing the technic of cerebral damage by sterile starch injections from the yellow fever work by Sawyer and Lloyd,[17] we were able to break the blood-central nervous system

11. Hudson, N. P., and Lennette, E. H.: The Specificity of Neutralizing Antibodies in Poliomyelitis, to be published.

12. Aycock, W. L.: A Study of the Significance of Geographic and Seasonal Variations in the Incidence of Poliomyelitis, J. Prev. Med. **3**: 245-278 (May) 1929.

13. Jungeblut, C. W., and Engle, E. T.: An Investigation into the Significance of Hormonal Factors in Experimental Poliomyelitis, J. Exper. Med. **59**: 43-61 (Jan.) 1934.

14. Hudson, N. P.; Lennette, E. H., and King, E. Q.: Failure to Neutralize the Poliomyelitis Virus with Sera of Adult Macacus Rhesus and of Young Female Rhesus Treated with Anterior Pituitary Extracts, J. Exper. Med. **59**: 543-552 (May) 1934.

15. Lennette, E. H., and Hudson, N. P.: Relation of Olfactory Tracts to Intravenous Route of Infection in Experimental Poliomyelitis, Proc. Soc. Exper. Biol. & Med. **32**: 1444-1446 (June) 1935.

16. Lennette, E. H., and Hudson, N. P.: The Blood-Central Nervous System Barrier in Experimental Poliomyelitis, to be published.

17. Sawyer, W. A., and Lloyd, Wray: The Use of Mice in Tests of Immunity Against Yellow Fever, J. Exper. Med. **54**: 533-555 (Oct.) 1931.

barrier and obtain fatal infections with virus given intravenously. Three normal monkeys so treated died of poliomyelitis, while six controls without starch in the brain showed no reaction. Apparently, the cortical injection of sterile starch permitted the intravascular virus to enter the damaged nerve cells from the capillaries and the disease progressed therefrom. It is impossible to say whether the damage to the nerve cells or the break in the blood capillaries is the more important factor.

This principle of damage allowing the parasitization of nerve cells was disclosed further when, by the mere cutting of certain large peripheral nerve trunks, fatal infections were induced by immediate intravenous administration of amounts of virus previously found sublethal to normal animals. The femoral nerve was cut in three monkeys, the sciatic in two and the vagus in two; poliomyelitis developed in one monkey with a cut femoral nerve and in one in which the vagus was sectioned.

To summarize, it appears that the nervous system is the essential site for the pathogenesis of poliomyelitis virus invasion, that the olfactory tract is an important route of entry to the body, and that there is a distinct barrier between the vascular and nervous systems, which can be broken by mechanical means. Thus the distinctness of the central nervous system from the remainder of the body in the pathogenesis of experimental poliomyelitis becomes even more apparent.

COMMENT

A conception of the mechanism of immunity in poliomyelitis is based on the direct and indirect types of evidence furnished by the accumulated knowledge of the epidemiology, pathology and pathogenesis of poliomyelitis, and the nature of the virus and the experimental disease. It would be tiresome to the reader, if not well-nigh impossible, to make satisfactory and just reference to all the work that has added with a steady crescendo to our acquaintance with this condition. The availability of the monkey as an experimental animal has allowed a finer perception of the factors in immunity not only through the analysis of factors of resistance in the experimental condition but also in the study of the disease as it exists in the natural host.

We conceive of acute anterior poliomyelitis as being transmitted from person to person most commonly by droplet infection. It is not sufficient to rely on acute cases as sources of virus, and the rôle of carriers and missed cases is indicated not only by the evidence of epidemiologists but also by the work of experimentalists (Kramer[18] and others). Once the virus has reached the individual, it may lodge in the nasopharynx or tonsils or enter by the gastro-intestinal route. We believe that the latter route is not likely, although we recognize the weight of certain epidemiologic evidence. Whether the virus increases in its mucosal nidus in the upper respiratory region is not known. Multiplication in this site would result in its maintenance in the population by offsetting the effect of dilution by transfer. Increase in the enclosed central nervous system in acute and subacute cases does not wholly account for the prevalence and distribution of the virus in man, unless a recontamination of the nasal mucosa by exuded virus is hypothecated in such individuals. We[15] have reported finding the virus in this region after intravenous injection of large amounts of virus, amounts probably not present in the vascular system in the natural infection. Burnet,[19] on the basis of experiments with the louping-ill virus in rats, proposes that that virus may be discharged onto the mucosa from the parasitized olfactory cells. Elucidation of the problem of nasopharyngeal residence of the poliomyelitis virus awaits further experimentation.

The next step in the immunologic process is the absorption of the virus from the mucosal surface. Evidence that others and we have presented points clearly to the exposed nerve endings of unmedullated nerve fibers as the route of entry of the virus into the body. The first cranial nerve represents such a portal, the parasitization of which leads to the virus invasion of the central nervous system. The factors that determine the absolute or relative degree of invasion begin with the condition of the upper respiratory tract, as detailed under the consideration of the mucosal barrier, and perhaps as obtains in the pathologic state (e. g., tonsillectomy).

Once the virus has entered nervous tissue, its migration seems to continue along axonal pathways, passing from the olfactory tract through the hypothalamus, thalamus and medulla to the cord. The evidence for this sequence was reviewed by Faber.[20] The significant point is that the virus has been traced in nerve cells. While such information is taken from studies on acute infections, there is no reason to doubt its occurrence in subacute and nonclinical experience with the virus. A question concerning immunity is whether the virus remains restricted to the cells of the nervous tissue. If it does, a tissue resistance, of a type not now understood, may account for the relative insusceptibility had by those who have experienced an exposure of their nervous tissue to virus; if it is not restricted, and this we are inclined to accept, the more extensive effects of immunity may become manifest, with antibodies appearing in the blood serum in addition to tissue resistance. The factors that control the outcome of a primary exposure to virus are not definable but probably include those vague forces that are operative in determining the parasite-host balance in infections in general. One significant factor may well be the amount of virus that an individual acquires or possibly cultivates on his mucosa. Once it has penetrated the nerve cells, however, the undefined forces referred to seem to exert an influence. Considering the epidemiology of poliomyelitis, the duration of immunity may depend on the result of the original exposure or on the repetition of exposure.

As discussed in the general experimental section, neutralizing antibodies in the serum of man and monkeys seem to be specific in nature. If this is true, evidence must be looked for that the virus leaves the nerve cells and acts as an antigen, stimulating the antibody-producing cells of the body. Experimental evidence confirms this not only in the occasional finding of virus in the blood stream during experimental infection but also in our demonstrating the virus in the spleens of monkeys cerebrally inoculated. These obser-

18. Kramer, S. D.: Immunity to Poliomyelitis in the General Population: Probable Mechanism of Production, J. A. M. A. **99**: 1048-1050 (Sept. 24) 1932; Detection of a Healthy Carrier of Virus of Poliomyelitis Without History of Contact, Proc. Soc. Exper. Biol. & Med. **32**: 1165-1172 (April) 1935.

19. Burnet, F. M.: Inapparent Infection of the Rat with Louping-Ill Virus, J. Path. & Bact. **42**: 213-225 (Jan.) 1936.

20. Faber, H. K.: Acute Poliomyelitis as a Primary Disease of the Central Nervous System, Medicine **12**: 83-186 (May) 1933.

vations indicate the probable mode of antigenic sensitization of extranervous tissue and would account for the presence of serum antibodies.

The conception that the body is immunized by virus that migrates perhaps variably from its intraneural site allows for the irregularity of antibody content in the serum. Furthermore, an explanation for the observation that sometimes the virucidal content of serum of persons without an acute attack is higher than of those convalescent from this disease may lie in the possibility that the former are more effective in their antibody response while the latter are less efficient in this regard, are more susceptible and on recovery have responded with a lower serum antibody content.[21] To postulate this, however, one must consider that the serum property is an indication of neural overflow of virus and hence is but a mark of exposure of body tissue to the antigen. Its occasional absence in the blood of human convalescents and its very infrequent lack, as observed by us, in the serum of monkeys convalescent from acute attacks support the idea of tissue resistance without extraneural migration of the virus.

We have been unable in our experiments to determine the site of antibody formation. Some experimental evidence we have offered tends to show that, once the virus has left the axonal pathways, the spleen may play a rôle in resistance. Because of the difficulties in this type of experimentation with the poliomyelitis virus, however, too much emphasis should not be placed on this evidence. Nevertheless, because of the interpretive significance of antibodies, we propose that cells and parts outside the central nervous system contribute to manifestations of immunity in poliomyelitis. This gains support in the claims of clinicians that patients react as to a generalized infection, and of pathologists who have described changes in the lymphoid system in fatal cases.[22]

The possibility arises that antibodies result from a vascular distribution of the virus from the upper respiratory tract. This is conceivable and is not incompatible with the neural migration of virus, since we have shown how virus intravenously injected was recovered from the nasopharynx of monkeys and did not cause disease in animals so injected whose olfactory tracts were sectioned. If the virus primarily becomes intravascular, it appears that the migration by the olfactory tracts is the probable secondary route, in view of our experiments on the barrier between the vascular and central nervous systems. The primary vascular invasion would explain much in immunity and would be acceptable if it were not for the necessity of granting the neural route from the nasopharynx, in which case the direct migration by this pathway may better be considered in the natural droplet infection of poliomyelitis.

Much experimental work has been done on the problem of artificial immunization. Gordon[10] dealt with this by injections of virus adsorbed to alumina-gel and of virus purified by adsorption to and elution from the same gel. His experience was that, in the attempt to immunize, fatal infections occasionally occurred and that, even under these extreme circumstances, neutralizing antibodies were not always produced and almost all monkeys surviving "vaccination" were still susceptible to virus administered intranasally. As others have found,[23] amounts of potent virus too near the lethal limit were necessary for the production of immune bodies in the serum. The failure to build up a resistance to the virus in nerve cells finds its explanation in the distinctiveness of the nervous system from the remainder of the body so far as the pathogenesis of the disease is concerned.

Schultz and Gebhardt[24] have expressed a similar point of view, especially in connection with the apparent inability of injected immune serum to reach and block the virus in its intracellular location in the nervous system. Correspondingly, artificial active immunization may be inadequate in furnishing protection by extraneural stimulation of antibodies. Abundant evidence is at hand, however, that proves "vaccination" possible, and we have accomplished it by intravenous injection of relatively large amounts of virus. The necessity of extreme measures for the production of an effective active immunity may be due to a barrier surrounding the central nervous system, similar to the blood-central nervous system barrier to intravenous virus. The penetration of this barrier by antibodies for the protection of the central nervous cells may be possible only when near-lethal amounts of active virus are used. The question naturally arises, therefore, as to the desirability of attempting active immunization of man under these circumstances, and further, whether serum antibodies induced by injection of virus are necessarily an indication of protection of the nerve cells to virus invasion.

As has been so often expressed by students of poliomyelitis, measures designed to produce both active and passive immunity must take into account the properties of the virus and the peculiar pathogenesis of the disease, and be directed toward the immunization of the cells of the central nervous system.

SUMMARY

Elements concerned in the resistance of the experimental animal Macaca mulatta to acute anterior poliomyelitis were investigated.

1. A certain degree of resistance was demonstrated in the nasopharyngeal mucosa, although ample evidence was found that pointed to the upper respiratory tract as the portal of entry of the virus. The intestinal mucosa was an effective barrier to infection by virus administered in isolated intestinal loops.

2. The rôle of the spleen as an organ involved in resistance was studied by the effect of its removal before and after the intravenous injection of virus. Splenectomy seemed to reduce the resistance in two of eleven monkeys and then only when the operation was done before virus injections. In other experiments, virus was found in the spleen in the first twenty-four hours after intravenous or intrasplenic injection. Its disposal in the spleen seemed to depend in part on the contained blood antibodies, since the virus was recovered from spleens of monkeys dying of poliomyelitis only when the organs were perfused. The site of antibody formation was not defined.

21. Brodie, Maurice: The Antibody Content of Acute Poliomyelitis Cases as Compared with Normal Individuals, Proc. 37th Annual Meeting, Soc. Am. Bact., New York, Dec. 26-28, 1935, J. Bact. **31**: 36 (Jan.) 1936.

22. Poliomyelitis, International Committee for the Study of Infantile Paralysis, Baltimore, Williams & Wilkins Company, 1932, p. 169, 259.

23. Olitsky, P. K., and Cox, H. R.: Experiments on Active Immunization Against Experimental Poliomyelitis, J. Exper. Med. **63**: 109-125 (Jan.) 1936.

24. Schultz, E. W., and Gebhardt, L. P.: Observations on the Therapeutic Value of Specific Immune Serum in Experimental Poliomyelitis, J. Pediat. **6**: 615 (May) 1935; Observations on the Prophylactic Value of Specific Immune Serum in Experimental Poliomyelitis, ibid. **7**: 332 (Sept.) 1935; On the Problem of Immunization Against Poliomyelitis, California & West. Med. **43**: 111 (Aug.) 1935.

3. Neutralizing antibodies were formed in monkeys "vaccinated" with certain preparations, but their presence was not an indication of effective protection of the animals to intranasal virus.

4. Natural or artificially induced menstruation and physiologic maturation of monkeys did not lead to the formation of a demonstrable virucidal property of the blood.

5. Sectioning of the olfactory tracts prevented infection not only after intranasal virus but also after injections of virus intravenously. The selectivity of the virus for this pathway to the nervous system was further indicated by the recovery of virus from the nasopharynx of other monkeys infected by the blood stream.

6. An explanation was found for the relative resistance imposed as a barrier to the virus between the vascular and central nervous systems. Sublethal doses were made fatally infective by damage to the cerebral cortex by starch injections, and to certain large peripheral nerve trunks by section.

These experiments may be interpreted as meaning that the poliomyelitic infection is primarily and largely of the central nervous system.

A theory of immunity in poliomyelitis logically develops from an analysis of pathogenesis and factors of resistance. We conceive of the virus of this disease as entering the body by the olfactory tract, migrating intracellularly through the central nervous system to the loci of predilection in the cord, and sensitizing the nervous tissue in some way so that it is resistant to reexposure to the virus. The virus apparently escapes from the nervous tissue and irregularly invades the body, exciting the defense mechanisms of the body with the stimulation of antibody formation. The neutralizing antibody in the natural condition is thus an indication of specific sensitization by extraneural stimulation after nerve cell migration of the virus. Antibodies induced by the artificial conditions so far devised are not necessarily a measure of nerve tissue resistance.

Artificial immunization of man, either active or passive, should take into account the distinctness of the central nervous system in the pathogenesis of poliomyelitis and the significance of certain factors of resistance. The interpretation of demonstrable antibodies should be made in the light of these observations, and measures of immunization may well be directed toward the neural features of the disease.

Clever People and Quacks.—I have noticed that clever people are usually fools about their own health. The nice clever people, those who have great gifts and an accompanying simplicity of soul, fall into the hands of charlatans and dishonest healers because, knowing nothing of objective pathology, they will accept any statement or treatment which the quack likes to suggest. . . . The difficult and rather worthless type is the successful, usually rich, person, who having differentiated himself from the common herd by the amassing of money, or the purchase of a title, must needs be individual in his therapeutic adventures. The common basis for the absolute and stupid faith which such a man exercises in respect to some new treatment is conceit, for he cannot bear to be as other men are and must always know better than the ordinary mortal. Examples of this stupidity, of this Athenian demand for some new thing, are so numerous that I will not attempt to chronicle them, but every practitioner probably hears of a case of this sort about once a month.—Howard, Christopher: The Art of Medicine, *Lancet* **1**:754 (March 28) 1936.

LOW BASAL METABOLIC RATE AND THE USE OF DESICCATED THYROID

JOHN M. BERKMAN, M.D.
ROCHESTER, MINN.

While certain facts relative to the occurrence of low metabolic rates have been definitely established, there are other factors concerning which there is little conclusive knowledge. Although a low rate of metabolism is common to all the conditions under consideration in this paper, it is quite apparent that the causes of this low rate are different.

The basal metabolic rate is maintained in the organism in part by thyroxine, which acts in the tissues as a catalyst and, to some extent, regulates the rate of energy transformation. It is a known fact that in normal individuals approximately 40 per cent of the heat production, as measured by the consumption of oxygen, is controlled by the thyroid gland. When the thyroid gland is destroyed and the organism has had sufficient time to become free from thyroxine, the basal metabolic rate drops to from —40 to —45 per cent.

When in association with a known depletion in the body's supply of thyroxine the basal metabolic rate has dropped to —18 or —20 per cent, certain physical disturbances associated with the disease myxedema become apparent. The basal metabolic rate may, however, fall to much lower levels than this without the appearance of the characteristic physical changes of myxedema and without any apparent disturbance of the thyroid gland. Thus the question arises as to whether depression of the basal metabolic rate must of necessity be dependent on a deficiency of thyroxine. Although at present no positive answer can be given to this question, the evidence suggests that the thyroid gland is not involved, at least primarily, in all conditions associated with basal metabolic rates lower than the standard average normal.

That the thyroid gland plays only a small part, if any, in the production of a low basal metabolic rate in conditions other than myxedema is suggested by the fact that, in the treatment of myxedematous patients with desiccated thyroid, very obvious conditions both physical and otherwise are completely eradicated by such treatment, whereas, in the treatment of nonmyxedematous patients with low metabolic rates, desiccated thyroid is often required in much larger doses to maintain a normal basal metabolic rate, but it does not bring about any apparent physical change.

Any classification of conditions associated with a low metabolic rate must, then, take these facts into consideration, and a workable classification must ignore many highly important but unknown factors. A classification which satisfactorily separates conditions associated with a low rate of metabolism is given in the accompanying tabulation.

MYXEDEMA

Myxedema is caused by either partial or complete destruction of the thyroid gland by extirpation, disease or a combination of the two. It may occur spontaneously as a result of a degenerative process, the cause of which, when known, usually is thyroiditis. It may also occur following thyroidectomy in cases in which the gland was previously affected by a degenerative process; in such cases the thyroid tissue remaining, although

From the Division of Medicine, the Mayo Clinic.

under ordinary conditions adequate in size, does not produce sufficient thyroid secretion to prevent myxedema.

In true hypothyroidism it is known that, when the basal metabolic rate falls below —20 per cent, characteristic nonpitting edema is going to be present to some extent. Usually, if the disease is kept in mind, the characteristic appearance of swelling about the eyes and face, dryness of the skin and hair, and both mental and physical slowness lead to a correct diagnosis. These symptoms, together with the deliberate and thick speech, aching and stiffness of the joints, marked intolerance to cold, and the peculiar pallor so characteristic of the disease, usually direct one's attention to the diagnosis if one is familiar with the condition. Not infrequently hoarseness is the disturbing symptom that causes the patient to consult his physician.

The characteristic tendon reflex of myxedema which is so pathognomonic of the disease is one in which the contraction component is normal but the relaxation component is markedly slower than normal, at times being so slow as to appear to be absent. This sign is always best seen in the achilles tendon reflex; however, not infrequently it is present in all reflexes of the extremity.

In the usual textbook picture of myxedema, a marked gain in weight is given as the rule. However, many patients have not experienced a gain in weight and many patients with myxedema are thin. It is true, of course, that patients who are naturally somewhat obese have great difficulty in reducing their weight even on a near starvation diet. This fact is easily accounted for by the low rate of metabolism and the inactivity accompanying myxedema.

Myxedema is frequently accompanied by secondary anemia. This, associated with the macrocytosis, high color index and achlorhydria, frequently leads to a diagnosis of pernicious anemia, the characteristic clinical picture of myxedema having been disregarded. An increase in the anemia occurs shortly after beginning treatment with desiccated thyroid. This increase is relative rather than actual because, shortly after treatment has been started, the edema begins to disappear and the plasma volume becomes increased without effecting a change in the cellular content. Frequently the greater part of the edema disappears after the first few days of treatment when 3 or 4 grains (0.2 or 0.24 Gm.) of desiccated thyroid is used as the initial dose. During this stage of treatment it should be remembered that there is a tendency toward an increase in urea in the blood.

There are other interesting and unexplained features of the disease, some of which may be confusing. There is an increase in size of the heart shadow in the six-foot roentgenogram. This increase in size may not at first be apparent, because the heart may not be considered abnormally large for the patient's age. But often, when a roentgenogram taken before treatment was begun is compared with one taken after treatment has been given, enlargement of the heart is evident.

Three principal electrocardiographic changes are seen in cases of myxedema and these changes disappear after treatment. The change most frequently seen is flattening or inversion of the T waves. The second change, which occurs much less frequently, is prolongation of the PR interval, which persists after administration of atropine. The third change is rare and consists of definite prolongation of the QRS complex.

Menorrhagia is not an infrequent occurrence in cases of myxedema, and in the absence of primary pathologic conditions in the uterus it responds satisfactorily to treatment of myxedema.

The values for cholesterol in the blood are almost invariably definitely elevated. The significance of this has as yet not been satisfactorily explained.

During the treatment of myxedema and prior to the time that the basal metabolic rate approaches normal, much larger amounts of desiccated thyroid may be necessary to elevate the metabolic rate and to maintain it at an elevated level than later on. At times, after a normal basal metabolic level has been reached, it is surprising what a small amount of desiccated thyroid is necessary to maintain that level. This is probably best explained by a change in the absorption of desiccated thyroid. It would appear that, during the stages in the treatment in which the metabolic rate is so low, the desiccated thyroid administered is not so completely absorbed as it is when the metabolic rate has reached a normal level.

There is no disease known that it more satisfactory to treat than myxedema.

LOW BASAL METABOLIC RATE WITHOUT MYXEDEMA

Since 1917, H. S. Plummer has recognized a group of cases in which the basal metabolic rate is below the average normal level but in which edema and some of the other characteristics of myxedema do not develop. This group comprises a much larger number of cases than any of the others mentioned. The characteristics of myxedema do not develop in these cases although the basal metabolic rate may fall much lower than —20 per cent, and deafness, slowness of recovery of the peripheral reflexes, hoarseness, slowness of mental and physical reactions, slowness of speech, and electrocardiographic changes do not occur except in the presence of coincidental disease.

Patients have the sallow complexion so characteristic of a low metabolic rate. The skin is usually dry, but there is much less tendency to scaling than in cases of myxedema. Fatigue is probably the most common and frequently the most prominent symptom. Gastric acidity is frequently low and achlorhydria is common. The values for cholesterol in the blood, although frequently higher than normal, are not as a rule as high as in cases of myxedema. The majority of these patients are asthenic and their complaints are of a functional nature, resembling those of neurasthenic patients. The symptoms and complaints coincide closely with those of the usual exhaustion syndrome. There seems to be a familial tendency in these cases to a lower than normal basal metabolic rate. In all probability the low basal metabolic rate has been present long before the patient is seen, or it had always been present. Therefore, the evidence is not sufficient to state that in this group of cases the lowered rate of metabolism is directly responsible, even in part, for the illness of which the patient complains.

In this group of cases there are subgroups in which certain symptoms are so predominant as to make them principal complaints. The symptoms otherwise correspond in general to those of asthenia.

Menstrual Disturbances.—Because of the comparative infrequency with which menstrual disturbances are associated with a low basal metabolic rate, and because of the occurrence of menstrual disturbances in the absence of the latter, one is not warranted in consider-

ing a low basal metabolic rate as necessarily being an abnormality. It is probably in such cases an individual characteristic.

The disturbances of menstrual flow associated with a low metabolic rate are amenorrhea, oligomenorrhea, and menorrhagia. Mussey and Haines [1] gave a group of patients who had amenorrhea, oligomenorrhea or menorrhagia and a low basal metabolic rate carefully regulated doses of desiccated thyroid by mouth. In order to determine the effectiveness of giving desiccated thyroid alone in such cases, no other form of treatment was used. Haines and Mussey found that definite improvement was obtained in 72 per cent of the cases in which patients had amenorrhea, in 55 per cent of those in which patients had oligomenorrhea, and in 73 per cent of those in which patients had menorrhagia. They also found that aside from whether or not there was improvement in menstrual function, about 75 per cent of the entire group of patients reported improvement in their general health after elevation of their basal metabolic rates to within average normal limits.

Conditions Associated with a Low Metabolic Rate

1. Myxedema: A definite clinical entity associated with positive physical signs, including nonpitting edema, and a basal metabolic rate of —20 per cent or lower.
2. Low basal metabolic rate without myxedema: A large group of cases that includes several subgroups. These may be classified in accordance with various physiologic disturbances which are not of necessity associated with any physical characteristics. The low basal metabolic rate may be a familial characteristic and it is often associated with asthenia.
   A low basal metabolic rate without myxedema may be associated with:
   (*a*) Menstrual disturbances.
   (*b*) Sterility.
   (*c*) Hypersecretory rhinitis.
3. Anorexia nervosa: Lowered basal metabolic rate associated with a combination of psychic disturbances and diminished intake of food. It may or may not affect individuals whose basal metabolic rate was previously within normal limits.
4. Hypopituitarism: A definite clinical entity associated with characteristic physical signs but without edema, regardless of the basal metabolic rate.

Sterility.—Cases are sometimes encountered in which, although intolerance to cold and fatigability have been bothersome symptoms, sterility has occasioned the examination of the patient. In certain of these cases, conception has occurred following the finding of a low basal metabolic rate and its elevation by the use of desiccated thyroid.

Hypersecretory Rhinitis.—This third subgroup comprises cases in which patients complain chiefly of obstruction of the nasal passages. In these cases the mucous membrane of the nasal passages appears edematous, as in vasomotor rhinitis; however, the wet appearance noted in cases of vasomotor rhinitis is not present. Hypersecretory rhinitis is occasionally recognized as being associated with a low basal metabolic rate. At times there is satisfactory local response to elevation of the basal metabolic rate by administration of desiccated thyroid.

ANOREXIA NERVOSA

Anorexia nervosa is a term applied to a group of symptoms resulting from psychic disturbance and from starvation, the characteristics of the clinical picture being so constant as to warrant its acceptance as a definite clinical entity. The sequence of events appears to be as follows: A psychic disturbance develops which is directly responsible for, and is followed by, loss of appetite. The resulting lessened intake of food finally leads to inanition, which in turn brings about a low rate of metabolism. This decrease in the metabolic rate has a tendency to depress the appetite still further, because less nourishment is required to maintain bodily weight when the metabolic rate is low than when it is normal or high. In this manner a vicious circle arises.

Most of the loss of weight occurs early in the course of the disease, and at a certain point the weight becomes more or less stationary. It appears that depression of the basal metabolic rate in such cases acts somewhat as a protective mechanism, for, if the metabolic rate should remain normal, death would undoubtedly occur rapidly. The fact that the favorable results which have been observed have occurred after considerable time, even though the metabolic rate and intake of food had been maintained near normal, suggests that other secondary degenerative processes have taken place as a result of inanition.

In cases of low basal metabolic rate caused by true hypothyroidism, the clinical features of the condition appear following depression of the metabolic rate. In anorexia nervosa it seems that the opposite occurs; that is, the low basal metabolic rate follows, rather than precedes, the appearance of clinical evidence of the condition. Although patients with anorexia nervosa are to some degree intolerant to cold and may have dry hair and dry skin, they do not have the facial edema so characteristic of myxedema. Many of them, however, have metabolic rates lower than those frequently found in cases of marked myxedema. In cases of true hypothyroidism in which the basal metabolic rate is lower than —20 per cent, facial edema is present; this has not been true in any of the cases of anorexia nervosa seen at the clinic. Consequently, in these cases the lowered metabolic rate has not been considered to be attributable to primary hypothyroidism.

Between the years 1917 and 1930 a diagnosis of anorexia nervosa was made at the clinic in 117 cases, which would indicate that the condition is not so common as one might expect. Although the condition is not limited to younger individuals, a majority of the patients were between the ages of 18 and 35 years. Eighty-nine of the 117 patients were females, and it is interesting to note that 53 per cent of these female patients had amenorrhea. Menorrhagia did not occur. The basal metabolic rates of the majority of the 117 patients ranged from —20 to —42 per cent.

As to the appearance of these patients, two striking characteristics attract one's attention at first glance: the extreme emaciation and the rather marked pallor. That the pallor is attributable to the low basal metabolic rate and not to the anemia is shown by the fact that, in the entire group of 117 patients, none had an erythrocyte count of less than 4,000,000 per cubic millimeter. The patients appear preoccupied, but when questioned they respond quickly. Their general attitude seems to be one of apathy.

The two principal complaints are (1) loss of appetite and of weight and strength, and (2) various gastro-intestinal disturbances, which do not correspond to the conditions found in any of the well known gastro-intestinal diseases. These gastro-intestinal symptoms, which consist mostly of gas, distress, fulness and pain, are exaggerated immediately after meals and occur in the epigastrium.

Benedict and others have shown by observation of professional fasters that even in the less severe degrees

1. Mussey, R. D., and Haines, S. F.: Amenorrhea and Oligomenorrhea Associated with Low Basal Metabolic Rates, Am. J. Obst. & Gynec. **27**: 404-407 (March) 1934.

of undernutrition in healthy individuals depression of the basal metabolic rate occurs. This was accompanied also by a fall in the systolic blood pressure.

While the treatment in some cases of anorexia nervosa is very satisfactory, this is far from being the rule, and there are several factors such as insufficient funds and inability to cooperate which may make the problem of treatment difficult. Response to treatment occasionally is so satisfactory, however, that one feels warranted in attempting it in all cases, even though the patient's refusal to cooperate may appear to make such treatment worthless from the start. Reestablishment of a normal intake of calories is the direct goal, and to this end treatment with a preparation of thyroid gland has been proved to be a valuable adjunctive measure.

HYPOPITUITARISM

Pituitary insufficiency is very frequently associated with a subnormal basal metabolic rate. The chromophobe type of tumor of the anterior lobe of the pituitary gland is by far the most frequent cause of hypopituitarism. Cushing and Davidoff [2] reviewed 107 cases of histologically verified chromophobe adenoma of the pituitary gland and found the average basal metabolic rate to be —14 per cent. The rate was below —20 per cent in twenty-one of these 107 cases.

Patients suffering from hypopituitarism have a characteristic pallor, but it differs from that of myxedema in that it is waxy, the skin appearing as though it were thin and almost transparent. The skin rarely has a tendency to scale; also the facial edema which is constantly present in myxedema is lacking. The secondary anemia that is so often seen in association with myxedema is not present in cases of hypopituitarism.

Myxedematous patients frequently have alopecia, and at times there may be considerable loss of hair of the scalp. This is not the case in hypopituitarism. The cutaneous hair, especially of the face and pubis, is frequently absent in hypopituitarism, which is not the case in myxedema. This lack of facial hair and the characteristic pallor are frequently diagnostic when the patient is a man. In hypopituitarism, with the exception of the extremely rare case of Simmons' cachexia, there is usually some tendency to obesity. In the male such obesity tends to have the feminine characteristics such as are seen in the presence of a marked Fröhlich syndrome.

The symptoms of hypopituitarism may be purely general and of no diagnostic value; however, during routine general physical examination homonymous hemianopia may be roughly elicited. In such cases further and more conclusive evidence is obtained from examination of the perimetric fields and from roentgenologic examination of the sella turcica.

Simmons' cachexia, although rare, may present considerable difficulty in distinguishing it from anorexia nervosa; however, some of the differential features just mentioned may aid in diagnosis.

Usually, the general appearance of both myxedema and hypopituitarism suffice to make the differential diagnosis. Naturally, hypopituitarism does not involve the use of desiccated thyroid in treatment.

THE USE OF DESICCATED THYROID

There are two distinct indications for the use of desiccated thyroid in which its value has been definitely shown: (1) as a specific in the treatment of myxedema and (2) as a method of elevating a low basal metabolic rate to normal in the absence of myxedema for the purpose of improving the general condition of the patient. Desiccated thyroid has been used extensively, regardless of patients' basal metabolic rates, both as a means of reducing weight and as an adjunct in connection with a weight reduction diet. It has also in some instances been used both preoperatively and postoperatively with the intention of speeding up the rate of the blood stream and so preventing postoperative venous thrombosis and pulmonary infarction. The limits of this paper, however, do not permit discussion of these two uses of desiccated thyroid.

In general it would appear that, either through lack of familiarity with the use of desiccated thyroid or with the conditions under which its use is indicated, the full effect of this substance has in many instances not been obtained. Patients are seen to whom desiccated thyroid has been given for short periods because of various conditions for which, from both a theoretical and practical standpoint, its use is not indicated. Equally often the estimation of a single basal metabolic rate has been the only criterion for the use of desiccated thyroid. In the absence of myxedema or of the symptoms of a low metabolic rate without myxedema, such as fatigue, intolerance to cold, and menstrual disturbances as described before, the use of desiccated thyroid is not indicated, even though the basal metabolic rate has repeatedly been found to be below the normal average for an apparently healthy individual. It should be remembered that in some instances a basal metabolic rate below the normal average is in all probability an individual characteristic.

Occasionally, desiccated thyroid is given without previous metabolic determinations, the pulse rate being followed frequently and this being considered to be indicative as to whether the dose should be increased or decreased. This method, in which the dose is of course entirely empirical, is not advisable and leads to unfavorable results.

There is apparently some misunderstanding also as to the time it takes for desiccated thyroid to produce an effect, as many patients have been told not to take it at night as it might cause insomnia. The action of desiccated thyroid is slow, and therefore to some extent cumulative; also, following the ingestion of desiccated thyroid a considerable period elapses before the effect of the drug has entirely disappeared. For clinical purposes one should wait a month before attempting to determine an individual's basal metabolic rate following the use of desiccated thyroid. It has been shown that, following cessation of the administration of thyroxine to myxedematous patients, the daily loss of thyroxine is approximately 6.5 per cent of the quantity then present. A curve showing this reveals a rapid loss of thyroxine at first, the loss becoming increasingly slower as time goes on. The most rapid disappearance of thyroxine occurs during the first two weeks, the rate of disappearance from then on becoming slower. At the end of a month, as stated before, the effect of either thyroxine or desiccated thyroid has for all practical purposes disappeared.

As a general rule one does not expect favorable results from elevation of the metabolic rate unless that rate is in the region of —16 per cent or lower and when such a rate is associated with definite symptoms, the most significant of which are fatigue and intolerance to cold.

As a routine, in the absence of nephritis and cardiovascular disease, an initial dose of 12 grains (0.8 Gm.) over a period of three or four days may be used, the

2. Cushing, Harvey, and Davidoff, L. M.: Studies in Acromegaly: IV. The Basal Metabolism, Arch. Int. Med. **39**: 673-697 (May) 1927.

dose being the same each day. At the end of that time a metabolic determination is made. Assuming that the original metabolic rate was in the region of —20 per cent, the rate of the majority of individuals will be elevated to a point between zero and —10 per cent. A dose of either 1½ or 2 grains (0.1 or 0.13 Gm.) of desiccated thyroid is then given, and at the end of another four or five days the metabolic rate is again determined. Depending on the value of metabolic determinations at intervals of every four or five days, an individual dosage will be determined which will maintain the basal metabolic rate at from —3 to —5 per cent. It has been found that the general feeling of these patients is better when the metabolic rate is maintained at a level slightly below zero than above it. To maintain this level, in the majority of cases 1, 1½ or 2 grains of desiccated thyroid is required daily. In other cases, however, the dose needed may be more or less dependent on trial; in some instances it may be found that 1 grain daily, for either five or six days out of each week, will be required.

When the original metabolic rate was considerably lower than —20 per cent, it may be found that after an interval of a few days following the initial dose of 12 grains a second course of 12 grains over a period of three or four days may be required to bring the metabolic rate above —10 per cent. At times, especially in the presence of severe associated conditions such as chronic nephritis, coronary sclerosis and severe hypertension, extreme caution should be used in administering desiccated thyroid, small doses such as 1 or 1½ grains being used from the beginning of the treatment.

In determining the maintenance dosage, it must be remembered that each patient presents an individual problem. To be sure that the dosage is correct, further metabolic determinations should be made at the end of a period of two months.

As a rule the time consumed in elevating the metabolic rate and in determining the individual dosage of desiccated thyroid is from three to four weeks. It is very important, especially in the treatment of myxedema, to remember that during elevation of the metabolic rate there may be retention of urea. This, of course, indicates the use of smaller doses of thyroid extract; also in the treatment of myxedema it may be found that, although it may have been necessary to use a comparatively large total amount of desiccated thyroid to elevate the metabolic rate to the desired level, a daily dose of less than 1 grain (0.065 Gm.) will maintain that level. In the treatment of anorexia nervosa it is important that at least a normal caloric intake be maintained during and after elevation of the metabolic rate to prevent further loss of weight.

It seems advisable also to mention the occurrence of symptoms which are very characteristic of and accompany elevation of the metabolic rate. Patients complain of headache and generalized aching and pain in the muscles and bones. There is a loss of appetite and, at times, nausea. These symptoms usually appear during the second or third day and increase in intensity into the second week, during which they gradually decrease. At the end of three weeks, adjustment to the normal metabolic rate has taken place and such symptoms disappear.

In cases of myxedema, when 12 grains of desiccated thyroid is used as the initial dose, the facial edema begins to disappear on the second and third days and may to a great extent be gone by the sixth day. There may be continued improvement in the general condition over a period of two months or even longer.

It has been our practice at the clinic to adhere to the use of desiccated thyroid prepared by one company, as there is considerable variation in the potency of preparations of desiccated thyroid put out by different companies. While the doses given in this paper may not be found to agree with figures obtained in other instances, the relative dosage will be found to be comparable.

This method of elevating the basal metabolic rate may appear time consuming and unnecessarily detailed, but it has proved in our experience to be the most satisfactory method.

ARTIFICIAL FEVER TREATMENT OF CHOREA

PRELIMINARY REPORT

CLARKE H. BARNACLE, M.D.
JACK R. EWALT, M.D.
AND
FRANKLIN G. EBAUGH, M.D.
DENVER

Since the installation of three Kettering hypertherms[1] in this clinic in February 1935 we have treated thirteen cases of Sydenham's chorea with artificial fever. Pyretotherapy has been so satisfactory that we wish to report the results at this time.

Sutton[2] in 1931 called attention to the treatment of chorea by the induction of fever with triple typhoid vaccine. Later reports by Sutton and Dodge[3] review the literature pertaining to fever therapy in the treatment of chorea and report satisfactory therapeutic results in 150 attacks of chorea with triple typhoid vaccine. They felt that it materially shortened the course of chorea, thus saving many hospital days. In 1935 these workers[4] continued their studies of fever therapy, using radiant energy in the treatment of rheumatic carditis. These workers conclude that "artificial fever therapy produced by intravenous injection of typhoid vaccine or radiant energy has no harmful effect on carditis in these children." Reports at the fifth annual fever convention at Dayton, Ohio,[5] indicate that "results with artificial fever treatment of twenty-eight cases of chorea have been excellent. Many cases were cured and the majority notably improved. Associated endocarditis was not a contraindication." Desjardins[6] reports the results at the Mayo Clinic, stating: "Nine children with chorea who have been treated have all improved satisfactorily but greater experience will be required to give us a correct perspective on the value of artificial fever in comparison with other methods of treatment." At this clinic we have initiated a long term study of artificial fever therapy of chorea.

From Fever Therapy Department, University of Colorado School of Medicine and Hospitals.

1. This apparatus was conceived and perfected at Miami Valley Hospital, Dayton, Ohio, and at the Research Laboratories of the Frigidaire Division of the General Motors Corporation, Dayton. We are indebted to Dr. Walter M. Simpson and Mr. Charles F. Kettering of the General Motors Company for the privilege of using the apparatus, three hyperthems being now in constant operation at this clinic.

2. Sutton, Lucy Porter: Treatment of Chorea by Induction of Fever: A Preliminary Report, J. A. M. A. **97:** 1931 (Aug. 1) 1931.

3. Sutton, Lucy Porter, and Dodge, Katherine G.: Treatment of Chorea by Induced Fever, J. Pediat. **3:** 813 (Dec.) 1933.

4. Sutton, Lucy Porter, and Dodge, Katherine G.: Effects of Fever Therapy on Rheumatic Carditis Associated with Fever, J. Pediat. **6:** 494 (April) 1935.

5. Hench, P. S.: Clinical Notes on the Results of Fever Therapy in Different Diseases, report of the Fifth Annual Fever Convention, Proc. Staff Meet., Mayo Clin. **10:** 662 (Oct. 16) 1935.

6. Desjardins, A. U.: Fever Therapy, Texas State J. Med. **51:** 194 (July) 1935.

PROCEDURE

We are using the Kettering hypertherm,[7] an air conditioned cabinet, as a means of inducing artificial fever in the cases treated. In the treatment of the first few cases, fever sessions of two and one-half hours were given at intervals of from three to six days and at temperatures ranging from 103 to 106 F. (rectal). Experience has convinced us that the patients respond more rapidly if the two and one-half hour fever sessions are given daily at temperatures of from 105 to 106 F. (rectal). This procedure materially shortens the entire course of the chorea attack and quickly restores the patient to normal activity. It is our policy to insist on strict rest during the interval between treatments. Many of our cases were outpatients and were cared for in the home, while the more severe choreic cases required hospitalization. A cardiologist has carefully examined the cases with severe cardiac involvement and was consulted during the course of their treatment. The progress of the patient has been used as a guide to the amount of fever necessary.

CASES

We have classified our chorea cases as mild, moderate and severe. Mild cases imply minimal choreiform movements of an extremity or muscle group with trivial functional incapacity. Those cases classified as moderate show gross choreiform movements of the extremities, trunk and face. These children are unable to perform coordinated acts. They are unable to speak coherently and cannot feed or dress themselves. Hypotonia is a marked symptom. In severe cases there is total incapacity. Attempts at voluntary movements result in violent choreiform movements. The patients cannot speak, there is a marked difficulty in deglutition, and hypotonia is severe.

CASE 1.—A boy, aged 13 years, was referred from the cardiac clinic and treated as an outpatient. Treatment was started March 28, 1935, one month after the onset of a moderate chorea. There had been no previous attacks. Examination revealed advanced rheumatic endocarditis. An electrocardiogram disclosed left axis deviation. He was given ten fever treatments, of two and one-half hours each, of from 103 to 104 F. (rectal), at intervals of from three to four days. Improvement, after the first treatment, was rapid and steady. There was no evidence of chorea after the sixth fever treatment (April 13), but the course of ten treatments was completed. There has been no recurrence to date. He has been followed in the cardiac clinic and is now restored to full activity.

CASE 2.—A youth, aged 16, was admitted to the hospital May 25, 1935, in his first attack of a very severe chorea. The onset occurred seven weeks prior to admission and was associated with acute rheumatic fever and endocarditis. Treatment consisted of eight fever sessions of two and one-half hours, at from 105 to 106 F. (rectal), given at from four to five day intervals. After the third treatment, choreiform movements were present only after excitement. The condition was so severe on admission that intravenous sodium amytal sedation was necessary to carry the patient through the first two sessions. He had recovered on July 3, and he has suffered no recurrences to date. Cardiac conditions were unchanged.

CASE 3.—A girl, aged 11 years, admitted to the hospital June 3, 1935, presented her first attack of a moderate chorea. The onset, six weeks prior to admission, followed an attack of acute rheumatic fever with endocarditis. Roentgen examination showed moderate enlargement of the heart. She was given eight sessions of fever, of two and one-half hours each, at from 105 to 106 F. (rectal), at intervals of from three to four days. Improvement was steady following the first treatment, and there was no clinical evidence of chorea after the fifth session. A course of eight treatments was completed, July 11. Roentgen appearance of the heart was normal.

CASE 4.—A boy, aged 12 years, was admitted July 13, 1935, in a fulminating attack of severe chorea. There had been no previous attacks. The onset, two weeks before admission, followed an acute rheumatic fever associated with severe cardiac involvement. The heart was markedly enlarged to the left with pericardial effusion. Dyspnea was severe. He was given ten fever sessions of two and one-half hours each, at from 105 to 106 F. (rectal), at intervals of from three to four days. After the first session he was able to talk. After eight treatments (August 6), all evidence of choreiform movements had disappeared. However, at this time, following an infection of the upper respiratory tract, the pericardial effusion increased in amount. Two more treatments were given and the effusion subsided. Six months later examination of the chest revealed the heart to be of normal size without effusion. There has been no recurrence of chorea to date.

CASE 5.—A boy, aged 13 years, received as an outpatient July 9, 1935, suffered from moderate chorea. He had had no previous attacks. Examination revealed clinical evidence of rheumatic endocarditis with decompensation as evidenced by dyspnea, edema of the feet and ankles, and enlargement of the heart. He was given seven treatments of two and one-half hours each, at from 105 to 106 F. (rectal), at intervals of four days. There was no evidence of chorea after the fifth treatment, July 24. There has been no recurrence to date. The cardiac condition has steadily improved and the patient is now on a full activity program.

CASE 6.—A girl, aged 8½ years, admitted to the hospital Aug. 24, 1935, presented a first attack of acute, mild chorea. The onset occurred six days before admission, with no cardiac involvement. Treatment was started immediately. She received twenty-one sessions of fever of two and one-half hours each, at from 105 to 106 F. (rectal), at two to three day intervals. This case presented an unusual aspect in that the chorea became progressively more severe after the first eight treatments. However, following the total course of twenty-one sessions of fever, no choreiform movements were present. She was discharged October 23 as recovered, and there have been no recurrences to date. We have classified this case as severe.

CASE 7.—A boy, aged 11 years, admitted to the hospital Oct. 23, 1935, was suffering from his first attack of a moderate chorea. The onset three months before admission followed an acute attack of rheumatic fever associated with mitral stenosis with insufficiency. Prior to admission to this clinic he had been treated with a series of typhoid injections but had shown no response. Treatments consisted of eight sessions of fever of two and one-half hours each, at from 105 to 106 F. (rectal), given at intervals of from three to four days. He was discharged as cured, November 2. There has been no recurrence to date. The cardiac condition is unchanged.

CASE 8.—A girl, aged 5 years, was admitted Jan. 28, 1936, in her first attack of moderate chorea. The onset was associated with rheumatic fever and endocarditis two weeks prior to admission. Mild decompensation necessitated digitalis. Treatment consisted of four fever sessions of two and one-half hours each, at from 105 to 106 F. (rectal), given daily. She was discharged January 30, and since then there has been no recurrence of the chorea. The cardiac condition has improved and the digitalis has been discontinued.

CASE 9.—A girl, aged 11 years, entered as an outpatient Jan. 30, 1936, suffered from a first attack of moderate chorea. The onset occurred five weeks prior to admission and was associated with an emotional disturbance.[8] Treatment consisted of fifteen daily sessions of two and one-half hours each at from 105 to 106 F. (rectal). Improvement was noted after the first session and following the ninth treatment choreiform movements were noted only on attempts to perform finer coordinated movements. She was discharged February 20 as recovered. There has been no recurrence to date.

CASE 10.—A girl, aged 15 years, admitted Feb. 19, 1936, as an outpatient, suffered from her third attack of moderate chorea. The first attack occurred at the age of 4 and was of several weeks' duration. The second attack of chorea occurred at 11 years and was of one year's duration. The onset of the

7. This apparatus is described in detail in the following articles: (1) Simpson, W. M.: Artificial Fever Therapy in Syphilis, J. A. M. A. **105**: 2132 (Dec. 28) 1935. (2) Desjardins, A. U.; Stahler, L. G., and Popp, W. C.: Fever Therapy for Gonorrheal Infections: II. J. A. M. A. **106**: 960 (Feb. 29) 1936.

8. Ebaugh, F. G.: Neuropsychiatric Aspects of Chorea in Children, J. A. M. A. **87**: 1083 (Oct. 2) 1926.

present attack occurred one month prior to admission. Treatment consisted of ten two and one-half hour fever sessions at intervals varying from one to seven days at rectal temperatures of 105-106 F. (Behavior difficulty of this child influenced the interval of treatment.) The patient was discharged March 12 as recovered.

CASE 11.—A married woman, aged 17, admitted to the hospital Feb. 25, 1936, had severe chorea in her first attack. The onset seven weeks prior to admission was associated with peritonsillar abscess and an emotional upset. Treatment consisted of ten daily sessions, two and one-half hours each, at from 105 to 106 F. (rectal). There was marked improvement after the second treatment and the patient was discharged March 10 as recovered. The severity of the attack required intravenous sodium amytal sedation during the first treatment.

CASE 12.—A boy, aged 8 years, was admitted to the hospital March 4, 1936, in his first attack of moderate chorea. The onset two months prior to admission was associated with rheumatic fever. Our examination revealed no positive cardiac changes. Treatment consisted of daily fever sessions of two and one-half hours each, at from 105 to 106 F. (rectal). He was discharged March 10, following six treatments, as recovered.

CASE 13.—A boy, aged 7 years, admitted to the hospital March 6, 1936, presented a chronic case of severe chorea. There had been no previous attacks. Treatment consisted of eight daily fever sessions, of two and one-half hours each, at from 105 to 106 F. (rectal). Marked improvement was noted after the first treatment and recovery was evident on March 14.

Results in Treatment of Chorea with the Kettering Hypertherm

Case	Age	Sex	Duration Before Treatment	Severity	Complications	Number of Treatments, 2½ Hours, 103-106 F. Rectal	Interval (Days)	Total Hours	Duration of Treatment (Days)	Results
1	13	♂	4 weeks	Moderate	Endocarditis; rheumatic fever	10	3-4	25	34	Cured
2	16	♂	7 weeks	Severe	Rheumatic endocarditis	8	4-5	20	38	Cured
3	11	♀	6 weeks	Moderate	Mitral insufficiency; dilatation of heart; rheumatic fever	8	3-4	20	38	Cured
4	12	♂	2 weeks	Severe	Rheumatic fever; endocarditis; pericardial effusion; dilatation of heart	10	3-4	25	35	Cured
5	13	♂	3 weeks	Moderate	Mitral insufficiency with dilatation of heart and decompensation	7	3-4	17½	25	Cured
6	8½	♀	6 days	Severe	None	21	2-3	52½	40	Cured
7	11	♂	3 weeks	Moderate	Mitral stenosis with insufficiency	8	3-4	20	30	Cured
8	5	♀	2 weeks	Moderate	Rheumatic fever; endocarditis with decompensation	4	Daily	8½	4	Cured
9	11	♀	4 weeks	Moderate	None	15	Daily	37½	20	Cured
10	15	♀	4 weeks	Moderate	None	10	Irregular, daily-10	25	29	Cured
11	17	♀	7 weeks	Severe	Rheumatic fever	10	Daily	20	6	Cured
12	8	♂	8 weeks	Moderate	None	6	Daily	20	6	Cured
13	7	♂	13 weeks	Severe	None	8	Daily	25	8	Cured

RESULTS

According to the accompanying table it should be noted that our cases have all been either moderate or severe. It is well known that the duration of chorea, whether treated or not, is usually prolonged, the average case lasting from six to ten weeks and some extending into months. When the interval between sessions was from three to six days (cases 1, 2, 3, 4, 5, 6, 7 and 10) it is noted that the duration of the treatment was naturally longer, averaging about thirty-four days. Since we have changed our policy of treatment to daily sessions (noted in cases 8, 9, 11, 12 and 13) the duration of treatment has dropped to an average of nine days.

At first we were conservative regarding the frequency of treatment because of the cardiac complications but found that our choreic patients could tolerate daily sessions without difficulty.

It should be noted that all our patients recovered. The longest duration of treatment (case 6) was over a period of forty days. We believe that this was an unusual case in that the attack began as a mild chorea and with fever became severe. Whether or not this severity was due to fever or would have been the natural course in this particular attack is a question. The average amount of fever administered in our cases was twenty-four hours at from 105 to 106 F. (rectal).

The fact that we have had no recurrences to date requires no comment, since the series of treatment was begun only a year ago.

It is our belief that the amount of shock following the injection of triple typhoid vaccine, as shown by chills, vomiting, severe headache, extremely high fever and marked prostration, is a serious contraindication when there is already a badly damaged heart. With artificial fever we are able to avoid such complications and, as our results show, we have had no complications. We believe that there is a distinct advantage of artificial fever produced by mechanical means over the foreign protein method. One advantage to the method that we have used is the controllability of the temperature. Treatment may be terminated instantly should unforeseen complications arise. Furthermore, a specified dose of fever may be administered at will. None of our cases showed loss of weight during the fever sessions. We are able to maintain an adequate fluid intake by mouth [9] with maintenance of the fluid balance. We feel that this is important, as all the severe and many of the moderate choreic patients are badly dehydrated.

SUMMARY

Thirteen cases of chorea have been treated by artificial fever with the Kettering hypertherm.[10] Results thus far have been excellent, with recovery in all cases. Advanced rheumatic endocarditis has not been contraindicative to treatment. To date there have been no recurrences of chorea, though the period of observation has been short. Mechanically induced fever has certain advantages over induction by triple typhoid vaccine.

4200 East Ninth Avenue.

9. From 2,500 to 4,000 cc. of 0.6 per cent saline solution is used during each two and one-half hour fever session. The salt solution is necessary to replace chlorides lost by perspiration.

10. Since this paper was submitted for publication, we have treated seven additional cases of chorea; six of these patients have recovered, and one is still under treatment.

RENAL INSUFFICIENCY DEVELOPING DURING PROLONGED USE OF ALKALIS

REPORT OF A CASE

J. MURRAY STEELE, M.D.

NEW YORK

The occasional development of alkalosis during treatment with alkalis in individuals suffering from duodenal ulcer has, since Hardt and Rivers'[1] description in 1913, been mentioned frequently in the literature[2] and may take place even when no alkali has been used, provided severe intestinal obstruction with loss of chloride ions and of acids occurs.[3] It has even longer been recognized that in renal disease alkalis may not be well tolerated,[4] and the appearance of alkalosis during a course of treatment involving their use has in fact been regarded as evidence that the kidneys were already injured. Hardt and Rivers[1] suggested that prolonged use of alkalis might injure the kidneys, even in the absence of preexisting renal disease. Cases of damage due to this source have subsequently been described by Houghton[3] and by Jordan.[2] Berger and Binger[4] have recently reported a case of renal disturbance in which the renal function was almost certainly normal both before and after the state of alkalosis was observed. In rats it has in fact been shown that feeding alkalis may be followed by severe hematuria although at autopsy no lesion of the kidney is found.[5]

In the case here reported the behavior of the kidneys was studied from the time when damage following the taking of alkali was detected until they once more functioned in a normal manner. In this case, as in Lloyd's, the usual neurologic manifestations of alkalosis, nausea, headache, nervousness and tetany, were absent.

REPORT OF CASE

C. J., a man, aged 52, a lawyer, had had measles, chickenpox and malaria when he was a child. On several occasions he suffered from influenza. Attacks of tonsillitis were frequent until his tonsils were excised in 1914. Severe infections of his sinuses were frequent until 1930, when a medicinal preparation of some sort afforded him moderate relief. It appears that he complained of "minor stomach troubles" even as a young man. He first began to suffer from indefinite attacks of pain after eating in 1918. For this he took milk and antacid powders. The diagnosis was thought to be "acid stomach" based on chemical examinations and on the examination of roentgenograms. His pain gradually ceased in about three months. In 1926 pain recurred, more definite than in 1918, appearing regularly from one to one and one-half hours after meals; this attack also was relieved readily when he resumed the milk diet. The third attack in the fall of 1928 was relieved in six weeks by a modified Sippy regimen, which included his taking seven doses of chalk and soda and several glasses of milk a day. In the spring of 1929 pain again occurred. On this occasion an appendicectomy was performed. Afterward he suffered from an attack of bronchopneumonia. When he recovered, the abdominal pain had subsided. The fifth and last attack occurred one year later, in the spring of 1930. He then began to take chalk and soda regularly four or five times a day. The patient believes that difficulties with his stomach have usually followed episodes involving nervous strain or prolonged periods of difficult work or more frequently anxiety concerning his son's welfare.

He remained fairly well until October 1932, when a new train of symptoms began. He became fatigued on the least effort, either physical or mental, and experienced nocturia five

Recovery of Various Functions of the Kidneys Following Cessation of the Taking of Alkalis

Date	Blood Urea Nitrogen	Urea Clearance, per Cent	Excretion of Phenolsulfonphthalein, per Cent	Specific Gravity*	Casts: Hyaline	Casts: Granular	Red Blood Cells	Albumin
12/ 1/32	41.8	23.4	27.6	1.010	+	+	0	Faint trace
5/ 4/33	21.5	53.5	43.0	1.016	+	+	3 per high power field	Faint trace
6/ 7/33	18.0	63.0	....	.....	+	0	1 per high power field	0
10/11/33	17.1	90.5	....	1.018	(24 hrs.) 80,000		(24 hrs.) 100,000	0
5/22/34	15.5	89.5	....	1.019	+	+	0	Very faint trace
1/ 9/35	17.4	148.0†	....	1.026	(24 hrs.) 150,000	0	(24 hrs.) 450,000	0
6/ 9/35	17.7	96.3	....	1.024	14,100	0	211,500	0

* A sample of urine for this measurement was obtained during the last twelve hours of a twenty-four hour period without fluids and on a dry type of diet.

† This high value has, in all probability, to do with incomplete emptying of the bladder before the beginning of the test, since the values for the separate hours were 190 per cent for the first and 106 per cent for the second hour.

or six times (for fifteen years he had been accustomed to urinate once during the night). He lost about 20 pounds (9 Kg.). November 30 he came for advice because, following the finding of albumin in the urine on two occasions and once a few hyaline and granular casts, his physicians had, in accordance with the knowledge of the course of Bright's disease, offered him a rather grave prognosis.

The patient was well built but lean. The temperature was 98.6 F. by mouth, the pulse rate 81 and respiration rate 20 per minute. The height was 173.5 cm. and the weight 63.2 Kg. The skin was sallow. The ears, nose and throat were essentially normal. There was considerable dental work. The mouth was clean. Engorgement of the peripheral veins was absent. The lungs were clear. The heart was not enlarged to percussion or in the roentgenogram. The aorta was slightly widened. The sounds of the heart were clear and the second sound at the base was somewhat accentuated. A systolic murmur was heard at the apex. The rhythm of the heart was regular. In his electrocardiogram the electrical axis deviated to the left and the T_3 wave was negative. The pulse at the wrist was of fair force. The walls of the radial arteries were just palpable. The arterial pressure measured 164 mm. of mercury systolic, 90 diastolic. Examination of the abdomen brought to notice nothing abnormal. The liver, spleen and kidneys were not felt. There were no masses or areas of tenderness. Edema

From the Hospital of the Rockefeller Institute for Medical Research.

1. Hardt, L. L., and Rivers, A. B.: Toxic Manifestations Following the Alkaline Treatment of Peptic Ulcer, Arch. Int. Med. **31:** 171 (Feb.) 1923.

2. Ellis, A. W. M.: Disturbance of the Acid-Base Equilibrium of the Blood to the Alkaline Side; Alkalemia, Quart. J. Med. **17:** 405 (July) 1924. Venables, J. F.: Seven Cases of Alkalosis Following Alkaline Treatment for Duodenal Ulcer, Guy's Hosp. Rep. **75:** 152 (April) 1925. Jordan, Sara M.: Calcium Chloride and Carbon Dioxide Content of Venous Blood in Cases of Gastroduodenal Ulcer Treated with Alkalis, J. A. M. A. **87:** 1996 (Dec. 4) 1926. Gatewood, W. E.; Gaebler, O. H.; Muntwyler, Edward, and Myers, V. C.: Alkalosis in Patients with Peptic Ulcer, Arch. Int. Med. **42:** 79 (July) 1928. Cooke, A. M.: Alkalosis Occurring in the Alkaline Treatment of Peptic Ulcer, Quart. J. Med. **25:** 527 (Oct.) 1932.

3. Tileston, Wilder, and Comfort, C. W., Jr.: The Total Nonprotein Nitrogen and the Urea of the Blood in Health and Disease as Estimated by Folin's Methods, Arch. Int. Med. **14:** 620 (Nov.) 1914. Brown, G. E.; Eusterman, G. B.; Hartman, H. R., and Rowntree, L. G.: Toxic Nephritis in Pyloric and Duodenal Obstruction: Renal Insufficiency Complicating Gastric Tetany, ibid. **32:** 425 (Sept.) 1923. Tucker, W. J.: Uremia Following Gastro-Enterostomy, Wisconsin M. J. **20:** 528, 1922. Houghton, L. W.: Three Cases of Toxemia Following Obstruction Near the Pylorus, Guy's Hosp. Rep. **75:** 149 (April) 1925. Lloyd, N. L.: Two Cases of Pyloric Obstruction with Alkalemia and Renal Symptoms but No Nervous Symptoms, ibid. **75:** 157 (April) 1925.

4. Sellards, A. W.: The Determination of the Equilibrium in the Human Body Between Acids and Bases, with Especial Reference to Acidosis and Nephropathies, Bull. Johns Hopkins Hosp. **23:** 289, 1912. Berger, E. H., and Binger, M. W.: The Status of the Kidneys in Alkalosis, J. A. M. A. **104:** 1383 (April 20) 1935.

5. Addis, Thomas; MacKay, E. M., and MacKay, L. I.: The Effect on the Kidney of Diets Containing an Excess of Certain Food Elements, J. Biol. Chem. **71:** 157 (Dec.) 1926.

of the legs was not present. On fluoroscopic examination and in roentgenograms of the upper gastro-intestinal tract a persistent deformity of the duodenal bulb was found on filling with a barium sulfate meal, which suggested to the examiner the presence of duodenal ulcer. At no time was an outline of the opaque medium seen which suggested actual filling of the crater of an ulcer. On ophthalmoscopic examination slight sclerosis and some tortuosity of the retinal arteries and indentation of the veins were apparent. Observations with regard to the urinary constituents and renal function are more easily comprehended in the form of a table. December 1 the ability of the kidneys to excrete urea and to concentrate the urine was markedly impaired. The level of the urea nitrogen in the blood was elevated. The presence in the sediment of casts was taken as evidence that renal damage was, at the moment, taking place. The reaction of the urine to litmus was alkaline.

This patient, then, while taking large doses of alkali daily for the relief of abdominal pain, was found to be suffering from diminution of renal function of sufficient magnitude to elevate the urea nitrogen level of the blood. A moderate degree of general arteriosclerosis was present. It was thought that taking alkalis might have played a part in increasing the damage to kidneys already the seat of changes of arteriosclerotic Bright's disease. He was instructed, therefore, to refrain from taking alkalis except for the relief of pain, and a diet designed to contain little residue was recommended. Viosterol and liver extract were added to complete the diet. He was discharged December 2.

In the latter part of February 1933 he suffered severe intestinal hemorrhage while in Egypt. In addition to a more restricted diet, bismuth carbonate, triple basic magnesium phosphate and olive oil were prescribed. On May 4, except for a gain in weight of 5.31 Kg., there was little change in his general physical state. He said, however, that he felt less fatigued than he had for some time. Tests of renal function and examination of the urine were repeated. Considerable improvement had occurred as is brought out in the accompanying table. He was then taking [6] a bland diet, six "alucol" (colloidal aluminum hydroxide) tablets and a pint of milk daily. Other alkalis were not used. Since this time there have been no gastro-intestinal complaints. Steady gain in weight, relief from ready fatigue and decrease in frequency of nocturia followed and, as can be seen from the table, apparent recovery from the renal disturbance. Within six months the blood urea nitrogen returned to normal and has remained so since. In ten months the urea clearance rose to a normal level and has remained so. The power of the kidneys to concentrate the urine rose slowly to normal during a period of two years. Casts (almost entirely hyaline) and red blood cells continue to be present in numbers no greater than those normally encountered, and faint traces of albumin appear from time to time in the urine.

COMMENT

The course of this patient's illness illustrates several points which deserve emphasis. It appears that an individual may consume relatively large quantities of alkali for a number of years before signs of renal dysfunction appear. Second, it is worthy of comment that evidence of severe renal injury may occur before the development of obvious symptoms of alkalosis. This sequence of events has been noted by Lloyd.[3] In this instance fatigue and nocturia were the only complaints. Third, judging from the improvement of renal function subsequent to cessation of the use of alkalis, it appears unlikely that renal lesions, which if present must have been extremely slight, could have been responsible for the retention of alkalis. Fourth, the observation of Binger, Hastings and Neill [7] and of Myers and Booker [8] that some individuals with apparently normal kidneys cannot readily excrete alkali is important. The subject of the present report does not, however, appear to belong to their group, since the urine was alkaline to litmus. Unfortunately, there is no evidence to show that alkalosis existed, since the notion that disturbance of the acid-base balance of the blood may have taken place was not recognized until after considerable improvement had occurred. Finally, in this condition as well as in the usual varieties of nephritis, as Alving and Van Slyke [9] have pointed out, recovery of the power of the kidneys to concentrate urine lags well behind the recovery of the ability to secrete urea.

6. Dr. Thomas R. Brown was consulted in June 1933. He prescribed treatment for the disorder of the gastro-intestinal tract.

7. Binger, C. A. L.; Hastings, A. B., and Neill, J. M.: Edema Associated with Moderate Bicarbonate Administration During Convalescense from Pneumonia, Arch. Int. Med. **31**: 145 (Jan.) 1923.

8. Myers, V. C., and Booker, L. E.: Observations on the Excretion of an Acid Urine in Alkalosis, Proc. Soc. Exper. Biol. & Med. **22**: 512, 1925.

SUMMARY

The use of alkali through a span of many years for the relief of pain due to a duodenal ulcer was followed eventually by the passage of albumin, red blood cells and casts in the urine, and the appearance of severe renal insufficiency, as indicated by elevation of the urea nitrogen of the blood and marked decrease in the ability of the kidneys to excrete urea and to concentrate the urine. Recovery followed discontinuance of the use of alkalis. This train of events occurred in the absence of signs of alkalosis.

Sixty-Sixth Street and York Avenue.

CAROTENEMIA IN DIABETES

WALTER HEYMANN, M.D.
CLEVELAND

Xanthosis in diabetes is due to an accumulation of lipochrome pigments in the blood, the most conspicuous of which has proved to be carotene. Some authors [1] explain the hypercarotenemia occurring in diabetes by the increased content of carotene in the diabetic diet; others,[2] however, believe that the accumulation of carotene in the blood of diabetic patients is due to a disturbance in the metabolism of carotene which is connected with the metabolic disturbance due to the diabetes. This question deserves more than merely theoretical interest, because the biologic importance of carotene as the precursor of vitamin A is generally accepted.

I have tried to solve the problem by studying the response of the carotene content of the blood in diabetic and in nondiabetic subjects after the administration by mouth of a solution of carotene in oil (0.3 Gm. of carotene per hundred cubic centimeters of oil).

Table 1 shows that the carotene in oil given to healthy subjects in a single dose by mouth appears in the blood rather late, that is, certainly not during the first four hours but from eight to twelve to twenty-four to thirty-six hours after its administration, in spite of the fact that the solvent oil may be grossly recognized by the milky appearance of the serum from one to two hours

9. Alving, A. S., and Van Slyke, D. D.: The Significance of Concentration and Dilution Tests in Bright's Disease, J. Clin. Investigation **13**: 969 (Nov.) 1934.

From the Babies and Childrens Hospital of Cleveland and the Department of Pediatrics, Western Reserve University School of Medicine.

1. Bürger, M., and Reinhart, A.: Ueber die Genese der Xanthosis diabetica, Deutsche med. Wchnschr. **45**: 430, 1919. Wendt, H.: Beiträge zur Kenntnis des Carotin- und Vitamin-A Stoffwechsels, Klin. Wchnschr. **14**: 9 (Jan. 5) 1935.

2. (*a*) Umber: Diabetische Xanthosis, Berlin. klin. Wchnschr. **53**: 829, 1916. (*b*) Rabinowitch, I. M.: Carotinemia and Diabetes: II. The Relationship Between the Sugar, Cholesterol and Carotene Contents of Blood Plasma, Arch. Int. Med. **45**: 586 (April) 1930.

after administration. The most likely explanation of the delayed appearance of the carotene in the blood serum is that the pigment may be temporarily retained in the liver.

In order to determine the carotenemic reaction after enteral administration of the pigment to diabetic and nondiabetic subjects, it was consequently necessary to administer the carotene for four consecutive days, in three daily doses of 2 cc. each, and to determine the carotene content of the blood every second day for the two weeks following. Connor's [3] method was used, with the slight modifications described in a previous paper.[4]

Table 2 gives the essential clinical data concerning the ten diabetic children on whom the studies were made, and in the upper half of the accompanying chart are presented curves showing the effect on the carotene content of their blood serum. The figures in the first column of table 2 correspond to those placed at the beginning of each curve in this part of the chart, each curve thus representing the child so numbered in table 2.

The curves in the lower half of the chart show the effect on the carotene content of the blood serum of the twelve nondiabetic subjects who were used as controls. These were healthy children, free from infection of any kind, and were of the same age as the diabetic children.

The marked differences between the curves for the diabetic and the nondiabetic children may be easily seen. In the first place, as has already been stated, the fasting level of carotene is higher in the blood of the diabetic subjects, the average value being 0.592 mg. per hundred cubic centimeters compared with 0.254 mg. in the control group.

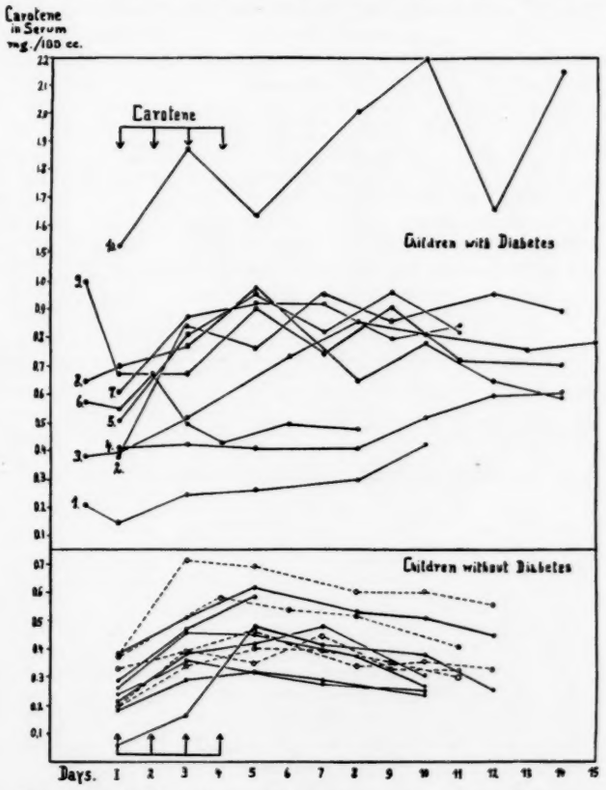
It can be seen from the data in table 2 that the degree of hypercarotenemia runs parallel to the duration of the diabetes except in the case of child 6, who had a definite hypercarotenemia in spite of having suffered from the disease for only two months. The parallelism between the fasting level of the carotene in the blood serum and the duration of the diabetes does not, however, answer the question whether the hypercarotenemia in diabetes is caused by a dietary or by a metabolic factor.

In order to eliminate the possible nonspecific influence of ketosis, which was present to greater or less extent in each of the diabetic patients studied, five of the nondiabetic children were placed on a ketogenic diet in which the ketogenic-antiketogenic ratio varied from 2.5:1 to 4:1. The results obtained with these five children are recorded by the broken lines and open circles in the lower half of the chart.

The second deviation, noticeable when the curves for the diabetic children are compared with those for the healthy children, occurs in five of the ten diabetic children. I have in mind the more or less marked retardation in increase in the carotene content of the blood serum after the administration of the carotene solution to children 1, 3, 4, 6 and 9. The data presented in table 2, however, show that these five children were ill with infections, while the remaining five diabetic patients, who did not show a retarded increase in carotene content of the blood serum, were free from infections.

Investigations by Clausen [5] and myself [4] have definitely shown that infections, whatever their nature may be, interfere greatly with the intestinal absorption of this pigment. The kind of interference just referred to in diabetic patients has been described by Clausen and by myself in nondiabetic children suffering from infections. Since this retarded absorption was not observed in the diabetic children who were free from infections (children 2, 5, 7, 8 and 10), there is consequently no doubt that the deviation from the normal as revealed by the curves has nothing whatever to do with the diabetic condition.

The third and specific deviation shown by the curves of the diabetic patients lies in the decreasing limb of the curve. If infections have not interfered with a sufficiently distinct increase in the carotene content of the



Curves showing the effect on the carotene content of the blood serum after administration of carotene in oil by mouth to ten diabetic and twelve nondiabetic children for four consecutive days, in three daily doses of 2 cc. each. The curves in the upper half of the chart show the carotenemic response in the diabetic children and are numbered to correspond with the clinical data for these children given in table 2. The curves in the lower half of the chart show the carotenemic reaction in the nondiabetic, healthy children used as controls. The broken lines and open circles represent the response in the five children in whom a ketosis was established by a ketogenic diet.

blood serum (as is the case in all the diabetic children studied except children 6 and 9), the curves remain elevated, failing to show the normal decline after the administration of carotene has been discontinued, or they even keep on rising (children 1, 2, 3, 4 and 10) for a period of from ten to fourteen days. The normal shape of the curves obtained in the five healthy children in whom a definite ketosis and acetonuria were induced by ketogenic diet rules out the possibility that the pathologic shape of the diabetic curves might have been due to the accumulation of ketone bodies. The nature of the diabetic hypercarotenemic reaction corresponds to the hyperglycemic

3. Connor, C. L.: Studies on Lipochrome: III. The Quantitative Estimation of Carotin in Blood and Tissues, J. Biol. Chem. **77**: 619 (May) 1928.

4. Heymann, Walter: Absorption of Carotene, Am. J. Dis. Child. **51**: 273 (Feb.) 1936.

5. Clausen, S. W.: Limits of the Anti-Infective Value of Provitamin A (Carotene), J. A. M. A. **101**: 1384 (Oct. 28) 1933.

response obtained in diabetic patients after the oral administration of sugar when the normal decline of the increased sugar content is similarly retarded. The analogous carotenemic reaction in diabetes, accordingly, can be regarded as a symptom of faulty utilization of carotene.

It is not surprising to find that the high fasting level of carotene in the blood serum, as well as the hypercarotenemic reaction, persists in diabetic patients who have been clinically sufficiently provided with insulin. The efficacy of insulin is known to increase slowly, to reach its peak after from two to three hours, and subsequently to decrease during the next two to three hours. Even when two or three doses of insulin a day are given, there still remain from six to twelve or more hours in which the intermediary carbohydrate metabolism cannot be regarded as entirely normal. The large fluctuations seen in the blood sugar level (table 2) in diabetic children to whom insulin was being given in adequate doses demonstrate clearly what has already been stated. It is clear, therefore, that the fasting level of the blood sugar and the fasting level of the carotene content of the blood of diabetic patients do not parallel each other, as has been pointed out by Rabinowitch.[2b] This fact, consequently, does not speak against the assumption that the faulty utilization of carotene demonstrated in these studies in diabetic patients is primarily related to the disturbance of the carbohydrate metabolism.

Another possible explanation of the hypercarotenemic reaction described in this paper, namely, the relationship between the diabetic carotenemia and the hypercholesterolemia, becomes unlikely because it has furthermore been shown [2b] that the diabetic hypercholesterolemia and hypercarotenemia do not always parallel each other. I therefore would prefer to look on the disturbance of the carotene metabolism occurring in diabetes as another and thus far not well understood consequence of the faulty utilization of sugar, just as the pathologic utilization of fat and cholesterol in diabetes is regarded.

SUMMARY

The blood serum carotene curves obtained in ten diabetic children after the administration by mouth of carotene in oil were distinctly different from those obtained in twelve nondiabetic, healthy children and demonstrated that the metabolism of carotene is interfered with in diabetes.

The carotene content of the blood, when it was once increased in the diabetic patients, failed to show the normal decline and remained elevated or even kept on increasing for from ten to fourteen days after the administration of the carotene in oil had been discontinued. The analogy with the hyperglycemic reaction after sugar is given by mouth to diabetic patients is striking and speaks in favor of assuming that the utilization of carotene has been interfered with in diabetes.

The diabetic carotenemia can consequently no longer be explained merely by the high carotene content of the diabetic diet.

2103 Adelbert Road.

TABLE 1.—*Observations Showing That Carotene in Oil Given by Mouth in a Single Dose to Healthy Subjects Does Not Appear in the Blood Until from Twelve to Twenty-Four Hours After Its Administration*

Name	Age, Months	Body Weight, Gm.	Amount of Carotene in Oil Given by Mouth, Mg.	Carotene Content of Blood Serum (Mg. per 100 Cc.) Fasting	½ Hr.	1 Hr.	2 Hrs.	3 Hrs.	4 Hrs.	8 Hrs.	12 Hrs.	24 Hrs.	36 Hrs.
B. P.	2½	3,800	20	0.082	.....	0.082	0.090	0.090	.....	.....	.....	.....	.....
J.	5	6,000	60	0.082	.....	0.070	0.070	0.082	0.082	.....	.....	.....	.....
W. F.	4	4,600	100	0.082	.....	0.082	0.082	0.094	.....	.....	.....	.....	.....
D. B.	12	9,300	44	0.152	.....	.....	.....	.....	0.152	0.152	0.175	0.246	.....
K. T.	1	3,200	30	0.140	.....	.....	.....	.....	.....	.....	0.060	0.095	.....
C. M.	108	26,700	80	0.421	.....	.....	.....	.....	.....	.....	0.421	0.386	0.538
W. T.	156	36,000	70	0.182	.....	.....	.....	.....	0.199	0.211	.....	0.363	.....

TABLE 2.—*Clinical Data Concerning the Ten Diabetic Children Given Carotene in Oil by Mouth, for Four Consecutive Days, in Three Daily Doses of 2 Cc. Each* *

Case†	Age, Years	Sex	Duration of Diabetes, Years	Evidence of Infection	Acetonuria	Diet, Gm. per Day: Protein	Fat	Carbohydrate	Amount of Insulin per Day, Units	Average Fluctuation of Blood Sugar During Study, Mg./100 Cc.: Minimum	Maximum	Fasting Level of Carotene in Blood Serum, Mg./100 Cc.	Comment
1	11	♀	1/12	Common cold	++	35	110	75	20-20-40	200	600	0.275	Precoma; dehydration
2	4	♀	1/12	Negative	(+)	25	82	140	5-5-5	42	250	0.375	Not comatose; no dehydration
3	7	♀	1½	Common cold	++	35	95	85	25-10	40	360	0.390	Precoma; dehydration
4	12	♂	2¼	Pharyngitis	+	40	95	120	15-5-5	69	920	0.410	Not comatose; no dehydration
5	8	♂	2½	Negative	++	30	90	60	5-5	52	300	0.515	Not comatose; no dehydration
6	7	♀	⅙	Otitis externa and media	—	35	96	100	6-10-6	60	300	0.580	Not comatose; no dehydration
7	10	♂	5	Negative	++	40	125	100	25-10	50	400	0.620	Not comatose; no dehydration
8	10	♀	6½	Negative	+	40	105	100	14-0-10	120	260	0.620	Not comatose; no dehydration
9	4	♀	2	Tuberculosis	+	25	56	100	7-5-3	95	450	0.994	Not comatose; no dehydration
10	4½	♀	2½	Negative	++	25	56	100	9-4-3	65	400	1.521	Not comatose; no dehydration

* The solution of carotene contained 0.3 Gm. of carotene per hundred cubic centimeters of oil.

† The carotenemic reaction of these children is shown in the accompanying chart, the curves in the chart being numbered to correspond to the numbers in this table.

ORCHITIS AND OOPHORITIS PAROTIDEA (OSLER)

REPORT OF TWO CASES

A. P. OHLMACHER, M.D.
ROYAL OAK, MICH.

Orchitis as a complication of mumps is a commonplace incident, the frequency of which has been placed by some authors [1] at between 10 and 25 per cent of cases, while others quote an incidence as high as 50 per cent [2] in certain epidemics. It is said that the orchitis may appear in from two to sixteen days after the parotitis, and most commonly in from four to eight days. The fever tends to persist for from two to six days and falls by lysis. A rather imposing proportion of atrophy, as high as 60 per cent according to Catrin,[3] is said to occur in the absence of operation, which, briefly, has in the reported cases consisted in the making of incisions in the tunica albuginea. Vezeaux de Lavergne and Florentin,[4] and Teissier recommend convalescent serum as an effective prophylactic against orchitis.

Ovarian involvement is uncommon enough to warrant more than passing attention, and but few and isolated instances of this phenomenon are recorded in the literature. Involvement of either the male or the female gonad is definitely inclined to appear as a late complication. According to Osler,[5] "the orchitis may occur before the parotitis, or in rare instances may be the only manifestation of the infection (orchitis parotidea)." He states succinctly that "involvement of the ovaries is rare."

The fact remains that cases of primary orchitis due to the virus of mumps are out of the ordinary,[6] while orchitis parotidea sans parotitis is observed but seldom. Bieberach and Vider in a recent report have added a case of the latter type to the literature, which previously contained, according to them, only sixty-four instances of this condition. Dillard [7] discusses certain facts of diagnostic importance and quotes, almost verbatim, the scholarly description of the pathology written by S. B. Wolbach, which was included in an article by George G. Smith.[8] The ovaries, perhaps owing to their relatively secure and protected position, are, as already stated, rarely involved even as a secondary complication. Mastitis and pancreatitis (abdominal mumps), uncommon sequelae of parotitis, are yet less unusual than oophoritis. Harlow Brooks [2] reports two cases of secondary oophoritis and concludes that the phenomenon is very unusual. He further emphasizes the benign nature of the ovarian involvement quite in distinction to the frequent destructive effects on the male cell. There is, to my knowledge, no reported case of primary oophoritis due to mumps without subsequent parotitis, while primary ovarian inflammation followed at an interval by parotid disease has been cited but exists only as a curiosity. Gueit [9] in 1913 reported a somewhat doubtful case of primary oophoritis in a woman, aged 21, in which the parotitis ensued on the sixth day following the onset of the abdominal symptoms. This author, as well as Brooks, mentions the differential confusion arising between right-sided oophoritis of this type and appendicitis, particularly in view of the fact that the pathologic changes in question are prone to present themselves in young individuals in whom careful pelvic examinations may not be feasible.

The following reports present an instance of the unusual orchitis parotidea sans parotitis along with one of the very exceptional primary oophoritis due to the virus of mumps:

REPORT OF CASES

CASE 1.—*History.*—A man, aged 27, single, the occupant of a rooming house, first seen on Oct. 18, 1929, complained chiefly of pain in the region of the right testicle, which in a few hours exhibited definite and progressive swelling, accompanied by pronounced tenderness to pressure. Concomitant aching sensations in the muscles of the lower part of the back and legs ensued, with symptoms of fever and prostration. The patient stated that there had been no urethral discharge and no recent venereal exposure. Interrogation revealed the existence, about two and one-half weeks previously, of cases of typical mumps in two of the landlord's children, and the fact that a third child was showing ominous symptoms.

The patient was positive that he had never had mumps. He likewise stated that he had not had a venereal disease.

Examination.—The patient was well nourished and muscular, and examination presented no important physical changes with the following exceptions: The temperature was 100 F. and the pulse 94. The right portion of the scrotum was moderately swollen and rather tense and showed increased local temperature. Careful palpation gave the impression that the swelling involved both testicle and epididymis, both of which had increased to about twice the normal dimensions. The process impressed one as being definitely less fulminant than the average case of gonorrheal origin; that is, there was less local heat, not such extreme tenseness, and a less exquisite tenderness to pressure.

Laboratory examination, October 18, revealed 7,800 white blood cells, with 38 per cent polymorphonuclears, 57 per cent lymphocytes, 4 per cent large mononuclears and 1 per cent eosinophils. November 2 the white blood cells numbered 7,600, with 60 per cent polymorphonuclears, 36 per cent lymphocytes and 4 per cent large mononuclears. The urine, October 18, was normal.

Treatment and Progress.—The patient was confined to bed, a nest of absorbent cotton fitted around the involved organ, and adhesive tape applied for suspension. The process began to subside after four days and the patient became ambulant on the tenth day. Increased firmness of the testicle to palpation persisted, but at eight months no atrophy was discernible. At no time during the course of this condition was any involvement of the salivary or other remote glandular structures observed.

CASE 2.—*History.*—A robust girl, aged 18 years, admitted May 2, 1932, complained chiefly of pain in the right lower quadrant of the abdomen.

The patient stated that she had been annoyed by a "slight stomach ache" for about forty-eight hours. Six hours before she presented herself this mild symptom was superseded by a severe cramplike pain localized in the right lower quadrant. Some nausea was present but no vomiting. There had been no evidence of recent respiratory infection. Her last menstrual period had terminated about ten days previously, and there had been no subsequent vaginal discharge. She had not defecated during the twenty-four hours prior to admission and had indulged in no catharsis or enemas prior to admission. Urinary symptoms were absent.

1. Ballenger, E. G., and Elder, O. F.: Orchitis from Mumps, J. A. M. A. **75**: 1257 (Nov. 6) 1920
2. Brooks, Harlow: Involvement of the Ovary in Epidemic Parotitis, J. A. M. A. **60**: 359 (Feb. 1) 1913.
3. Catrin: Orchitis ourlienne, Bull. et mém. Soc. méd. d. hôp. de Paris **11**: 108-123, 1894.
4. Vezeaux de Lavergne and Florentin: Prévention de l'orchitis ourlienne par injection de sérum de convalescents, Bull. Acad. de méd., Paris **93**: 362-364 (March 31) 1925.
5. Osler, William: Principles and Practice of Medicine, New York, D. Appleton & Co., 1930.
6. Waddelow, J. J.: Primary Epididymitis in Mumps, Brit. M. J. **1**: 1480, 1909. Edwards, L. B.: Primary Testicular Mumps, J. A. M. A. **33**: 963 (Oct. 14) 1899.
7. Dillard, G. J.: Orchitis, Due to Mumps Without Involvement of the Salivary Glands, J. M. A. Georgia **23**: 95 (March) 1934.
8. Smith, G. G.: Two Cases of Orchitis, Due to Mumps, Treated by Operation, Boston M. & S. J., 1912.
9. Gueit, C.: Ovaritis, Due to Mumps and Specific Parotitis, Montpellier méd. **37**: 199, 1913.

The past history was irrelevant except for the fact that intermittent attacks of transient abdominal pain had been observed for the past two years. She felt that these attacks were similar to the onset of the present illness.

Examination.—The patient was in considerable pain. The temperature was 99 F., pulse 100. The blood pressure was 118 systolic, 80 diastolic. There was no suggestion of a pathologic condition above the diaphragm. Abdominal palpation revealed tenderness rather definitely localized to the right lower quadrant, where spasm of the rectus muscle was elicited. There was no costovertebral tenderness. No evidence of discharge or inflammatory reaction was present about the introitus or the urethra. Digital rectal examination, combined with abdominal palpation, elicited pain, the source of which was thought not to be in the uterine adnexa.

Catheterized urine was entirely negative. A blood count was not done at this time. A blood count taken May 6 revealed 9,000 total white blood cells, with 30 per cent polymorphonuclears, 65 per cent lymphocytes, 4 per cent large mononuclears and 1 per cent transitionals.

Treatment and Progress.—In view of these observations we were unable to rule out appendicitis, and, accordingly, a laparotomy was performed. The appendix was found to be somewhat injected but otherwise grossly normal and was not considered to be the instigating factor. It was, however, removed as a routine. Palpation of the pelvic structures revealed a considerable enlargement of the right ovary. This was visualized and estimated to be about one and one-half times larger than its fellow on the left. It was firm and elastic to palpation and had a peculiar edematous appearance. The surface presented an unusual bluish tint, interspersed with a few very minute petechiae. Since no impression of an ordinary inflammatory or purulent change was manifested, the abdomen was closed without drainage.

For forty-eight hours the postoperative progress was uneventful. On the third day, however, the temperature, which had not exceeded 100 F., abruptly rose to 102, and the patient complained of aching sensations in both parotid areas. Swelling appeared and rapidly became extreme, presenting the picture of an unusually high degree of bilateral mumps. A rather disquieting reaction was provoked by this sequence of events, and marked prostration with striking elevation of pulse and considerable local distress persisted for about sixty hours, at which time an abrupt amelioration of the symptomatology ensued. There was at no time any suggestion of suppuration, fluctuation or other sign that we were dealing with a condition any different from the epidemic type of parotitis; the parotid swelling abated gradually, while the surgical convalescence, apparently not distorted, was uneventful.

COMMENT

It is interesting to recall the rather definite similarities existing in the appearance of the involved ovary in case 2 and that of the testicles exposed at operation by other workers.[10]

There would seem to be little doubt concerning the authenticity of this case of oophoritis parotidea. No other logical explanation for the appearance of the ovary, especially in the light of subsequent developments, can be readily advanced. It is unfortunate that a specimen for microscopic study was not obtained. The whole subsequent clinical picture, including the general physical condition of the patient, the chronological sequence of events leading to the development and subsidence of the parotid involvement and the physical characteristics of the salivary protuberances was definitely not that of the suppurative postoperative type of parotitis. We were convinced, incidentally, that the exposure and manipulation of the offending ovary were important factors in the prompt development and full blown picture assumed by the parotitis. Whether without operation the parotids would have remained unsullied and the case run its course ("full many a flower is born to blush unseen") as one of oophoritis parotidea sans parotitis is idle speculation.

It is probable that this excessively unusual pathologic process will always present enough similarity to acute appendicitis to suggest operative intervention strongly, even granting that watchful waiting and astute differential diagnostic efforts would surely be rewarded by cognizance of the true state of affairs.

419 Washington Square Building.

10. Smith.[8] Ballenger and Elder.[1]

GONORRHEAL VAGINITIS

RESULTS OF TREATMENT WITH DIFFERENT PREPARATIONS AND AMOUNTS OF ESTROGENIC SUBSTANCE

ROBERT M. LEWIS, M.D.
NEW HAVEN, CONN.
AND
ELEANOR L. ADLER, M.D.
NEW YORK

In 1933 one of us [1] described the administration of estrogenic substance as a practical method of treating gonorrheal vaginitis in children. Eight cases treated in this way with marked success were reported. The fact was established that sufficient estrogenic substance given to girls would bring about a temporary maturation of the undeveloped vaginal mucosa. The clinical results in these cases indicated that therapy with estrogenic substance was likely to be successful. Edgar Allen [2] had previously described a similar reaction induced in immature monkeys by treatment with estrogenic substance.

Since the publication of this article a number of reports on the results of therapy with estrogenic substance have appeared in the literature.[3] With one exception (so far as we know) each author has reported gratifying results.[4] Witherspoon [5] reported a total of ten cases treated without benefit. He used, however, a relatively small daily or nearly daily dosage of a preparation which both we and TeLinde have found unsatisfactory. In other reports therapy with estrogenic substance has yielded satisfactory and, in some cases, brilliant results.

During the past two years a study, generously financed by the Milbank Foundation, has been conducted in the Children's Medical Service of Bellevue Hospital, Department of Pediatrics, New York University. Supplementary work has been carried on in

From the Department of Obstetrics and Gynecology, Yale University School of Medicine, and the Children's Medical Service, Bellevue Hospital, New York University Department of Pediatrics.

1. Lewis, R. M.: Am. J. Obst. & Gynec. **26**: 593 (Oct.) 1933.

2. Allen, Edgar: J. Morphol. 72, 246, 1928.

3. Brown, Joseph: Treatment of Gonorrheal Vaginitis in Immature Girls, J. A. M. A. **102**: 1293 (April 21) 1934. Huberman, John, and Israeloff, H. H.: Therapeutic Value and Effects of Amniotin in Gonorrheal Vaginitis in Children, J. A. M. A. **103**: 18 (July 7) 1934. Miller, J. R.: Am. J. Obst. & Gynec. **29**: 553 (April) 1935. Goldberg, L. E.; Minier, C. L., and Smith, E. L.: J. Pediat. **7**: 401 (Sept.) 1935. Nabarro, D., and Signey, A. G.: Lancet **1**: 604 (March 16) 1935. TeLinde, R. W., and Brawner, J. N., Jr.: Am. J. Obst. & Gynec. **30**: 512-523 (Oct.) 1935. Reading, Boyd: South. M. J. **28**: 464 (May) 1935.

4. Since completing this paper our attention has been called to a report by R. B. Phillips (New England J. Med. **213**: 1026-1029 [Nov. 21] 1935). Phillips treated thirteen cases of true gonococcic vaginitis, or suspicious cases with theelin in oil—from 2,310 to 2,970 international units per week. All cases eventually yielded negative smears, but nine relapsed. Of these nine, three yielded positive smears and six "suspicious smears."

5. Witherspoon, J. T.: Treatment of Gonorrheal Vulvovaginitis in Childhood with the Ovarian Follicular Hormone, Am. J. Dis. Child. **50**: 913 (Oct.) 1935.

the New Haven Hospital by Alfred Cohn, Louis Weinstein and others. In all, 165 children with gonorrheal vaginitis have been diagnosed and treated by different methods. Various preparations and amounts of estrogenic substance have been used. In this paper only those giving definite results are mentioned. A number of cases in which results were inconclusive because of irregular or inadequate treatment are not included.

In our experience treating gonorrheal vaginitis of children with various local antiseptics has often proved difficult, and the results have usually been unsatisfactory. The number of preparations available are legion and no one can have tried all that are recommended. Generally speaking it is difficult to see how antiseptics can be relied on to destroy organisms that have penetrated and are thriving beneath the epithelium. We thought originally that the mere histologic change involved in temporarily converting the very thin vaginal mucosa of the child to the far thicker and partly cornified structure of the adult adequately explained the destruction of the invading gonococci. Further studies have convinced us that the curative result is in all likelihood due not to the histologic change alone but to a striking change in the reaction of the vaginal secretions. The nearly neutral reaction normal in childhood changes to a marked acidity which always accompanies the temporary maturation of the mucosa.

In view of the results with estrogenic substance that we as well as others have obtained, we believe that our first impression was correct; namely, that in gonorrheal vaginitis of children the infection is ordinarily confined to the vaginal mucosa and submucosa and that the endocervix is but rarely involved. It goes without saying that the cervix should be inspected for infection in every case in which this can be done without too much difficulty. In all cases in which infection lingers after adequate therapy, the cervix should be examined even if anesthesia is required to get a clear view. If endocervical infection is found in the unusual case, cauterization is indicated.

TABLE 1.—*Cases Presenting Gonorrheal Vaginitis in Which Negative Vaginal Smears Developed in Response to Treatment with 800 International Units of Estrogenic Substance in Ethylene Glycol Administered Hypodermically*

Case	Age	Duration Before Treatment	Total Dosage, International Units	Weeks Until Negative	Follow-Up	
					Time	Result
1	6 yrs.	1 day	12,400	4 wks.	20 mos.	Well
2	3 yrs.	1 yr.	8,800	6 wks.	10 mos.	Well
3	3 yrs.	4 mos.	6,400	4 wks.	10 mos.	Well
4	5 yrs.	3 wks.	34,400	12 wks.	17 mos.	Well
5	9 yrs.	Acute	12,400	3 wks.	7 mos.	Well
6	4 yrs.	Chronic	21,200	22 wks.	9 mos.	Well
7	2 yrs.	2 wks.	10,400	5 wks.	18 mos.	Well
8	5 yrs.	5 mos.	10,400	10 wks.	4 mos.	Well
9	2½ yrs.	1 wk.	23,600	9 wks.	15 mos.	Well
10	7 yrs.	6 days	80,800	16 wks.	12 mos.	Well
11	7 yrs.	6 mos.	20,800	7 wks.	15 mos.	Well
12	11 yrs.	Chronic	40,000	7 wks.	7 wks.	Well
13	8 yrs.	2 mos.	21,600	19 wks.	11 mos.	Well
14	8 yrs.	Chronic	42,000	4 wks.	15 mos.	Well
15	7 yrs.	? yrs.	14,000	2 wks.	5 mos.	Well
16	7 yrs.	6 days	56,800	11 wks.	11 mos.	Well
17	3 yrs.	3 wks.	18,000	13 wks.	6 mos.	Well
18	7 yrs.	6 days	18,000	9 wks.	13 mos.	Well
19	3 yrs.	2 mos.	59,200	11 wks.	4 mos.	Well
20	3 yrs.	10 mos.	11,200	2 wks.	13 mos.	Well
21	8 yrs.	2 wks.	45,600	20 wks.	8 mos.	Well
22	5½ yrs.	Acute	27,600	14 wks.	15 mos.	Well
23	3 mos.	Acute	43,200	13 wks.	2 mos.	Well
24	8 yrs.	3 days	25,600	10 wks.	10 mos.	Well
25	4 yrs.	Acute	40,200	17 wks.	15 mos.	Well
26	7 yrs.	Acute	22,000	12 wks.	14 mos.	Well
27	4 yrs.	Acute	44,000	8 wks.	3 wks.	Well

It is recognized that positive smears and positive cultures of gonococci can often be obtained from the rectum in cases presenting gonorrheal vaginitis.[6] This was confirmed by Alfred Cohn in those of our patients whom he studied. In eleven cases that yielded gonococci on vaginal smears, four cultures from the rectum also gave positive results. The rectal infection appears to be superficial and clears up in the great majority of cases *pari passu* with the vaginal infection. Only rarely does a deep-seated proctitis become troublesome.

TABLE 2.—*Cases Presenting Gonorrheal Vaginitis Treated by Daily Doses of 2,400 International Units of Estrogenic Substance in Ethylene Glycol Hypodermically*

Case	Age	Duration of Disease	Total Dosage, International Units	Weeks Until Negative	Follow-Up	
					Time	Results
1	3 yrs.	Acute	56,800	6 wks.	9 mos.	Well
2	4 yrs.	1 wk.	102,400	2 wks.	1 mo.	Well
3	6 yrs.	Acute	37,600	2 wks.	7 mos.	Well
4	2 yrs.	Acute	53,600	4 wks.	.....	Recurred in 1 mo.
5	3 yrs.	Acute	100,800	4 wks.	.....	Recurred in 2 mos.
6	8 yrs.	6 wks.	49,600	2 wks.	.....	Recurred in 2 mos.
7	2 yrs.	Acute	60,000	3 wks.	2 wks.	Well
8	18 mos.	Acute	54,400	4½ wks.	3 wks.	Well

There is a great divergence of opinion as to the average duration of gonococcic vaginitis treated with antiseptics. TeLinde found that four months was an average at the Johns Hopkins Clinic for cases so treated. We have found an average of four and a half months' duration in a series of thirty-five cases treated in the New Haven Hospital. A longer follow up might well have increased the length of our average figures. The Bellevue-Yorkville study [7] reports 241 cases under observation for from about five to sixteen months. Of 124 cases studied, forty-seven, or 37.9 per cent, were infected for from one to eleven years before admission to the clinic. The authors of this study conclude that three or four months of treatment with mercurochrome will render the vaginal smears of 70 per cent of such cases negative or "suspicious." We have seen cases of two and three years' duration and heard of one instance in which the infection lasted seven years.

In our cases the criterion for a diagnosis of gonorrheal vaginitis has been the finding in the vaginal smear of gram-negative diplococci morphologically resembling gonococci. In the limited number of our cases in which cultures or complement fixation tests were conducted, an extraordinarily high percentage of the diagnoses made by smears were confirmed. Dr. Alfred Cohn of the Department of Bacteriology at Yale University School of Medicine found that in twelve smears of positive cases ten gave positive cultures. In twenty-five smear-positive cases, complement fixation tests by Cohn and the Department of Health Laboratories, New York City, gave eighteen positive results, three doubtful and four negative.

Cases are reported in this paper as negative when no gonococci or pus cells were found on repeated smears. All such cases should be seen and smears should be examined for many months after an apparent cure has been effected.

6. Ruys, A. C., and Jens, P. A.: München. med. Wchnschr. **80:** 846 (June 2) 1933.

7. Brunet, W. M.; Tolle, D. M.; Scudder, S. A., and Medcalf, A. R.: Report of a project of the Bellevue-Yorkville Health Demonstration of New York City, reprinted from Hospital Social Service Magazine, sup. 1, March 1933.

During the first part of our study the patients were under the direct care of Dr. Helen Owen.

Sixty-six patients treated with 800 international units daily of estrogenic substance [8] in ethylene glycol given hypodermically yielded some results but on the whole rather unsatisfactory ones.

TABLE 3.—*Summary of Results* *

Case	Age	Duration Before Treatment	Total Treatment Dosage, International Units	Days Until Negative	Follow-Up	
					Time	Result
1	3½ yrs.	3 days	21,600	14	5 mos.	Apparently well
2	3 yrs.	1 wk.	37,200	28	.....	Recurred in 1½ mos.
3	6 yrs.	2 wks.	21,600	14	5 mos.	Apparently well
4	4 yrs.	1 wk.	23,480	10	5 mos.	Apparently well
5	4 yrs.	1 wk.	27,000	24	9 wks.	Apparently well
6	3 mos.	Acute?	24,600	21	.....	Recurred in 2 mos.
7	4 yrs.	2 wks.	25,200	19	4 wks.	Apparently well
8	4½ yrs.	4 days	27,600	25	4 mos.	Apparently well
9	6 yrs.	1 day	27,600	25	4 mos.	Apparently well
10	5 yrs.	Acute	19,200	17	4 wks.	Apparently well
11	9 yrs.	4 wks.	40,800	37	11 wks.	Apparently well but returned with 1 positive smear; no discharge; apparently well
12	7 yrs.	?	15,600	11	4 mos.	Apparently well
13	7 yrs.	1 wk.	30,600	37	7 wks.	Apparently well
14	10 yrs.	2 wks.	18,000	15	9 wks.	Apparently well
15	3 yrs.	3 days	16,200	9	13 wks.	Apparently well
16	4 yrs.	2 wks.	19,800	14	18 wks.	Apparently well
17	9 yrs.	2 wks.	47,400	30	9 wks.	Apparently well
18	3 yrs.	2 wks.	50,800	34	5 wks.	Apparently well
19	2 yrs.	Acute	23,200	23	7 wks.	Apparently well but returned with positive smear; no discharge
20	3 yrs.	3 days	25,200	8	9 wks.	Apparently well
21	4 yrs.	1 wk.	25,000	12	7 wks.	Apparently well
22	7 yrs.	1 wk.	38,000	24	5 wks.	Apparently well
23	2½ yrs.	2 days	40,000	26	4 wks.	Recurred; discharge and positive smears
24	2 yrs.	2 days	24,000	10	24 days	Apparently well
25	5 yrs.	1½ mos.	Still under treatment	16	10 days	Apparently well
26	8 yrs.	1 wk.	.....	48	3 days	Apparently well
27	5 yrs.	Acute?	Still under treatment	14	1 wk.	Apparently well
28	2 yrs.	1 day	Still under treatment	14	1 wk.	Apparently well
29	3 yrs.	2 days	Still under treatment	14	1 wk.	Apparently well
30	2 yrs.	1 wk.	Still under treatment	28	1 wk.	Apparently well
31	11 yrs.	5 mos.	Still under treatment	42	7 wks.	Apparently well but has positive urethritis
32	12 yrs.	Acute	.....	12 wks.	5 wks.	Apparently well
33	9 yrs.	5 wks.	45,800	12 wks.	7 wks.	Apparently well

* Children with gonorrheal vaginitis treated by means of estrogenic suppositories, one inserted into the vagina each night. Some suppositories contained 600 international units of estrogenic substance. Those used more recently contained 1,000 international units.

A further follow up of the cases treated with estrogenic substance in suppository form, observed through the four-month interval since this paper was written, showed that all but five patients have remained well for periods ranging from four to nine months. Patient 26, who was considered as being probably still infected, proved to have a persistent urethritis which was in all likelihood responsible for a relapse after two months. Cases 16, 17, 22 and 28 recurred after from two and a half to four months. These have all cleared up promptly under a second course of estrogenic substance, as did the three recurrent cases reported in the text.

Eight more cases in which treatment has been completed since this report was compiled, became negative in an average of 19.7 days. Only one case in the forty-eight cases treated with the suppository form of administration has failed to show the response to administration of estrogenic substance.

With this dosage (800 international units daily) twenty-seven cases became negative after treatment varying from two to twenty-two weeks, apparently with response to estrogenic substance. Six cases remained positive in spite of continuous treatment for from eighteen to thirty weeks, with no evidence of estrogenic reaction. Two of these patients were found to have an endocervicitis. Eight cases that recurred shortly after treatment was stopped were not considered to have been satisfactorily treated.

The remaining cases gave insufficient evidence from which to draw conclusions. Some became negative after very small doses of estrogenic substance and before any tissue reaction was observed; some in which treatment was interrupted while smears were still positive returned at a later date presenting negative smears. A few did not remain under observation after treatment was stopped. Many of the patients receiving only 800 international units of estrogenic substance by hypodermic daily showed only doubtful vaginal reactions. We have determined the presence or absence of response of vaginal mucosa to the different preparations and dosages used in this study by examining microscopic sections of minute biopsies.

Increasing the dosage of estrogenic substance in ethylene glycol yielded better results. Eight ward patients with gonorrheal vaginitis were given daily by hypodermic 2,400 international units in divided doses (table 2). Negative smears were obtained from this group in an average time of 24.2 days. They were followed thereafter for from two weeks to nine months. Three of these cases recurred, one in one month and two in two months. These cases were again treated until negative smears were obtained and have remained negative for from one to three months. No cases were treated with estrogenic substance in oil parenterally.

In the original paper [1] mention was made of the use of vaginal suppositories containing theelin. These were discarded at that time as not effective. It is probable that the amount of estrogenic substance contained in them was not sufficient to produce the desired vaginal reaction in a large percentage of the cases in which they were used.

Recently TeLinde and Brawner reported the use of vaginal suppositories containing 600 international units of estrogenic substance in cases of gonorrheal vaginitis. Their results were surprisingly and uniformly satisfactory. Twenty-two patients were treated and in all of them the infection disappeared, as evidenced by clinical observation and negative smears, in an average of from 17.8 to 29.4 days. They found that on an average 13.1 days was required to produce the initial characteristic response of the vaginal mucosa to estrogenic substance.

Of seventeen cases, five recurred but quickly yielded to a second course of treatment with estrogenic suppositories. Although little time had elapsed in some of their cases after apparent cure, all smears were negative when last examined.

Since hearing TeLinde's paper in June 1935, we have treated a series of thirty-three patients at Bellevue Hospital with estrogenic suppositories. At first suppositories of estrogenic substance containing 600 international units each were used. Recently this preparation was changed by the manufacturer to one containing 2,000 international units. One half of such a suppository containing 1,000 international units was inserted into the child's vagina each night before she went to bed. No vaginal washes or applications were used. The external genitalia were washed when necessary for cleanliness. The patients have been followed and observed for evidences of the estrogenic reaction and the development

8. The large amount of estrogenic substance (amniotin) required in all our work has been given to us most generously by E. R. Squibb & Sons.

of negative smears. Vaginal biopsies examined microscopically have shown that the estrogenic reaction of the vaginal mucosa has occurred regularly.

It is of course of the utmost importance to determine the presence or absence of the vaginal response to estrogenic substance in all cases, as without this tissue change no benefit can be expected. This was formerly done by securing minute biopsies and examining sections with the aid of the microscope. This method is time consuming and expensive. Vaginal smears showing extraordinary desquamation of epithelial cells are evidence that the estrogenic reaction has occurred. The inexperienced observer will, however, often be misled, particularly if the exfoliation is not great. The gross appearance of the vaginal mucosa and introitus is frequently helpful.

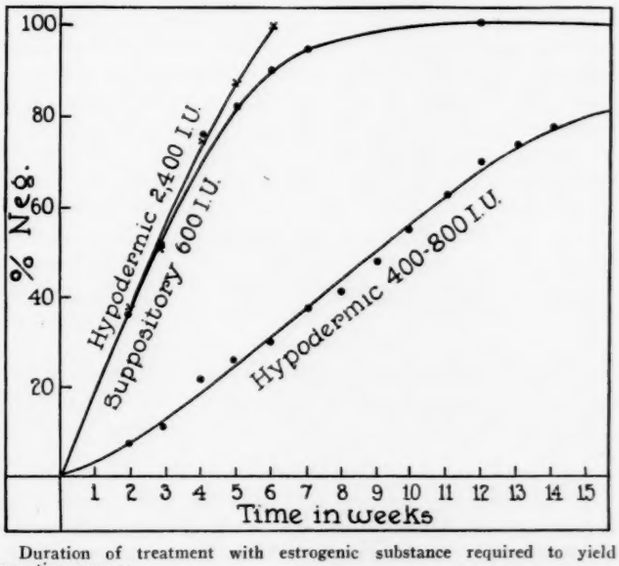
We wish now to stress the value of another simple practical test for the estral response which can be carried out easily in a few minutes. Long ago Döderlein [9] called attention to the presence of the bacillus named for him and considered its acid-forming properties as responsible for the acid reaction of the secretions of the adult female vagina. Zweifel later showed that it was the destruction of the superficial glycogen containing cells of the vaginal mucosa that produces much of the acidity. In the thin vaginal mucosa of the child but little glycogen is contained. On the other hand, the superficial cells of the adult vagina and, of more importance to us, of the vagina of the child adequately treated with estrogenic substance are loaded with glycogen. These as a result of bacterial or enzymatic action produce a markedly acid reaction as they break down. Soeken,[10] Cruickshank [11] and others have described the histologic changes that occur during puberty and ordinarily before the occurrence of the first menstrual period. They have also pointed out the dramatic and abrupt change to acidity in the reaction of the vaginal secretion which occurs at this time and that this in turn is accompanied by an equally rapid transformation of the vaginal flora.

Hall and Lewis [12] treated immature monkeys hypodermically with estrogenic substance and found that the vaginal secretions, which are faintly alkaline (p_H 7.5 to 8) in the normal animal, became suddenly strongly acid (p_H 5.4 to 5.7) as soon as the vaginal response to estrogenic substance occurred. In normal children the reaction of the vaginal secretions is nearly neutral (usually between p_H 6.8 and 8.4). We confirm Lewis and Weinstein's [13] observations which show that when the vaginal mucosa of children reacts to estrogenic substance the vaginal secretions change from near neutral to a well marked acidity (p_H 4.8 to 6).

In vitro the gonococcus grows best in a faintly alkaline medium (p_H 7.2 to 7.6). If this is rendered acid very gradually over a period of days or weeks these organisms will rarely adapt themselves to a medium as acid as p_H 6 to 6.2. Usually the culture dies before this point is reached. Tests that we have carried out to determine the p_H of the vaginal secretions of children in our series before treatment have given p_H values between 6.8 and 7.4. With the appearance of the estrogenic reaction of the vaginal mucosa (checked by biopsy and microscopic section), the vaginal secretions became acid (p_H 4.5 to 6.2), nearly always giving readings below 6.

In the few cases in which this reaction did not occur, either as a result of neglect in the administration of the estrogenic substance or because of some unknown constitutional factor which prevented the usual vaginal response to estrogenic substance, the infection ordinarily continued. Nearly every case in which the p_H of the vaginal secretions dropped to below 6 recovered from the gonococcic infection. Consequently we believe this acid change of the vaginal secretion is the important curative factor produced by administration of estrogenic substance in gonococcic vaginitis of children.

It is a simple matter to determine the p_H reaction of the vaginal secretions. The vagina is irrigated with 1 or 2 cc. of neutral physiologic solution of sodium chloride adjusted to a p_H of 7.0. Colorimetric readings of the p_H of the washings are made with brom-thymol-blue, brom-cresol-purple or brom-cresol-green as indicators, depending on the degree of acidity present. The



Duration of treatment with estrogenic substance required to yield negative smears.

results are read by comparisons with a set of standards. If an acidity below 6.2 is found it may be taken as evidence that the desired change in the vaginal mucosa has been brought about. This is much simpler and less time consuming than the taking of biopsies. When p_H readings in our cases were below 6.0, biopsies invariably showed that the vaginal mucosa had reacted to estrogenic substance. If readings remained near or above 7.0, no change had occurred, as the treatment had been inadequate.

The use of suppositories of estrogenic substance, as suggested by TeLinde and Brawner, has enormous advantages in point of simplicity over any other form of treatment with which we are acquainted. The treatment is readily carried out at home by any intelligent adult and needs only a weekly visit to the physician or dispensary. It is not uncomfortable for the little patient, as contrasted with the usual local applications or with our own earlier method of treatment by the hypodermic route. It is also apparently much more efficacious and less apt to cause temporary enlargement of the breasts. The use of the suppositories every night should continue for at least two weeks after the discharge ceases and smears have become negative. None of our cases have shown any stimulation of mammary

9. Döderlein, Albert: Das Scheidensekret, Leipzig, 1892.
10. Soeken, Gertrude: Ztschr. f. Kinderh. **47**: 27-37, 1929.
11. Cruickshank, R., and Sharman, A.: J. Obst. & Gynec. Brit. Emp. **41**: 369 (June) 1934.
12. Hall, Vincent, and Lewis, R. M.: Endocrinology **20**: 210 (March) 1936.
13. Lewis, R. M., and Weinstein, L., to be published.

development and none have exhibited bleeding from the uterus. None of our cases have shown any evidence of harmful results from the treatment. The treatment with suppositories must be carried out regularly. Irregular or inadequate treatment is no better than no treatment at all.

It is generally recognized that long-standing cases of gonorrheal vaginitis yield to estrogenic therapy more easily than do the recently acquired florid cases. In our group of thirty-three consecutive cases treated with suppositories of estrogenic substance practically all (table 3) were of the latter class.

Of a total of thirty-three cases treated with estrogenic suppositories in the manner that we have just described, in thirty the smears were negative in an average of 20.7 days. Patients 32 and 33 continued to have slight discharge and gonococci, until eventually after twelve weeks they appeared well. Case 31 showed negative smears for three successive days but is in all likelihood still infected.

Of the thirty-three patients five have had recurrences. Three of these had a return of purulent discharge and gonococci. Two have had no further vaginal discharge but a return with gram-negative diplococci in their smears. These two cases are being kept under observation. Of the other three recurrent cases, two now show negative smears after seventeen and twenty-eight days of further treatment with suppositories. The other recurrent case was started on a second course of treatment seven days ago and will probably clear up rapidly.

Two of the patients who appeared to have recurrences had presumably acquired their initial infections from an actively infected member of the household. Apparently cured of vaginitis in the ward, they were of necessity returned to their homes, where in each case the parent continued to be a likely source of fresh infection. We have classified these cases as recurrences although they may well have been reinfections.

CONCLUSIONS

1. In treating gonorrheal vaginitis, estrogenic substance in ethylene glycol given hypodermically was relatively effective when used in large doses: 2,400 international units daily. Eight hundred international units daily proved disappointing.

2. The use of vaginal estrogenic suppositories (originally 600 international units and later 1,000) proved very effective.

3. Clinical improvement, cessation or great diminution of discharge is nearly always noted after from fourteen to eighteen days of treatment.

4. The administration of estrogenic substance changes the reaction of the vaginal secretions from neutral or alkaline to acid. This, we believe, is the major factor in eliminating the gonococcic infection.

5. The acidity of the vaginal secretions is easily measured and provides a sure guide by which one can determine whether or not dosage is adequate.

6. Of thirty-three consecutive cases of gonorrheal vaginitis in children treated with estrogenic suppositories, thirty yielded negative smears in an average of 20.7 days. Two required twelve weeks of treatment. Five cases are listed as recurrences.

7. No ill effects were encountered. We believe that this method of treatment is safe and harmless.

8. We consider the use of vaginal estrogenic suppositories the most effective method known for the treatment of gonorrheal vaginitis in children.

52 Trumbull Street—Twenty-Sixth Street and First Avenue.

THE FEEDING OF MODIFIED GASTRIC JUICE IN PERNICIOUS ANEMIA

FREDERIC M. HANES, M.D.
O. C. HANSEN-PRÜSS, M.D.
AND
J. W. EDWARDS
DURHAM, N. C.

In a recent issue of THE JOURNAL Greenspon[1] offered an explanation of the rôle played by the gastric secretions in hematopoiesis that differs essentially from Castle's well known theory of the interaction of intrinsic and extrinsic factors. By feeding a pernicious anemia patient normal gastric juice so treated as to inhibit the action of pepsin, Greenspon states that a degree of reticulocytosis was produced which is comparable to the effect of liver therapy in pernicious anemia. It is obvious that such an experiment might easily be vitiated by the presence of "extrinsic factor" either in the stomach of the patient or in the gastric juice of the donor.

We have repeated Greenspon's experiment, adhering strictly to his technic, in five typical untreated cases of pernicious anemia. Fifteen normally healthy medical students have acted as donors of gastric juice, which in every instance has been tested for the presence of free hydrochloric acid. One donor with achlorhydria was rejected. Histamine (0.1 mg. per kilogram of body weight) alone was used to stimulate the flow of juice, and if there was evidence of food contamination the specimen was discarded.

CASE 1.—A man, aged 39, a farmer, gave a typical history of pernicious anemia of two years' duration. He had not been treated. The usual objective signs of pernicious anemia without involvement of the spinal cord were observed.

Examination of the blood on admission revealed hemoglobin 4.4 Gm. (28 per cent), erythrocytes 1,140,000, color index 1.25, mean corpuscular volume 122 cubic microns, leukocytes 2,150, reticulocytes 0.5 per cent and plasma bilirubin 0.5 mg. per hundred cubic centimeters.

Gastric analysis revealed no free hydrochloric acid after histamine (0.1 mg. per kilogram of body weight) subcutaneously.

After an observation period of four days during which the reticulocytes did not rise above 1 per cent, neutralized (tenth normal sodium hydroxide) and chilled gastric juice was fed by tube for nine days in doses of 340, 250, 250, 200, 260, 230, 200, 290 and 350 cc., a total of 2,370 cc. During the nine days of the gastric juice feedings and for four days thereafter there was no rise in the reticulocytes or erythrocytes, and the patient felt worse in every way. The appetite decreased.

Three intramuscular injections of 10 cc. of solution liver extract concentrated-Lilly (each cubic centimeter derived from 33 Gm. of liver) were given on successive days, and on the fourth day of liver treatment the reticulocytes rose to 20 per cent and increased steadily to 40 per cent on the sixth day after the first injection. The erythrocytes increased to 1,500,000. The mean corpuscular volume fell from 122 cubic microns on admission to 89.1 cubic microns nine days after the administration of gastric juice was begun. On the sixth day of liver treatment the mean corpuscular volume had increased to 123 cubic microns.

CASE 2.—A man, aged 58, a farmer, presented the classic history and objective signs of pernicious anemia of eight months' duration. He had not been treated.

Examination of the blood on admission revealed hemoglobin 5.4 Gm. (36 per cent), erythrocytes 1,170,000, color index 1.13, mean corpuscular volume 110, leukocytes 4,150, reticulocytes 0.4 per cent and plasma bilirubin 1 mg. per hundred cubic centimeters.

From the Department of Medicine, Duke University School of Medicine.

1. Greenspon, E. A.: The Nature of the Antipernicious Anemia Principle in Stomach: I. Method to Improve Stomach Preparations, J. A. M. A. **106**: 266 (Jan. 25) 1936.

Gastric analysis revealed no free hydrochloric acid after histamine (0.1 mg. per kilogram of body weight) subcutaneously.

After five days of observation during which the reticulocytes did not rise above 0.2 per cent, seven daily feedings of neutralized chilled gastric juice by tube were given in doses of 260, 280, 250, 175, 260, 260 and 270 cc., a total of 1,750 cc. Eight days after the first feeding of gastric juice the reticulocytes rose to 1.8 per cent and during the next six days counts of 2, 3, 3, 2.6, 3 and 1 per cent were made.

Liver therapy was begun seven days after the last gastric juice feedings. Ten cubic centimeters of solution liver extract concentrated-Lilly was given intramuscularly on two successive days. On the fourth day of liver therapy the reticulocytes had risen from 1 to 7.8 per cent and during the next five days rose to 39 per cent. The erythrocytes during the same time rose to 2,250,000. During the course of gastric juice feedings the mean corpuscular volume fell from 110 cubic microns to 71 cubic microns. On the sixth day of liver feeding the mean corpuscular volume had risen to 103 cubic microns.

CASE 3.—A man, aged 46, a farmer, had pernicious anemia of six years' duration; there was subacute combined degeneration of the spinal cord. He had received no liver therapy.

Examination of the blood on admission revealed hemoglobin 6.6 Gm., erythrocytes 1,570,000, color index 1.3, mean corpuscular volume 123, leukocytes 2,200, reticulocytes 0.2 per cent and plasma bilirubin 1 per cent.

Gastric analysis revealed no free hydrochloric acid after the injection of histamine (0.1 mg. per kilogram of body weight) subcutaneously.

After six days' observation, during which the reticulocytes never rose above 0.6 per cent, seven feedings of neutralized chilled gastric juice were given by tube in doses of 250, 250, 250, 180, 305, 250 and 300 cc., a total of 1,785 cc. During the period of the gastric juice feedings and for three days thereafter the reticulocytes did not rise above 1 per cent.

Acting on a suggestion which Dr. Castle had made in a letter to Dr. Greenspon, the patient was placed on the following dietary restrictions three days prior to the feeding of gastric juice and during the seven days of gastric juice feedings. The purpose of the diet was to exclude "extrinsic factors" as far as possible. "No meat, eggs, chicken, vegetables or fruit. Milk allowed in cooking and in tea or coffee. Diet to consist of white bread, rice, butter, macaroni, small amounts of ice cream, tea and coffee"; (quoted from a letter from Dr. Greenspon). On this diet, combined with gastric juice feedings, the patient grew steadily worse.

On the fourth day after the last feeding of gastric juice, liver therapy was given as follows: first day, 10 cc. of solution liver extract concentrated-Lilly; second day, 20 cc. of Parke, Davis & Co.'s liver extract for intravenous use (derived from 100 Gm. of liver); third and fourth days, 10 cc. of solution liver extract concentrated-Lilly. On the fourth day of liver therapy the reticulocytes were 10 per cent and rose to 42 per cent, as a maximum, on the fifth day.

During the course of gastric juice feedings the mean corpuscular volume fell from 123 cubic microns to 92 cubic microns and then rose to 119 cubic microns on the sixth day of liver therapy.

Two other patients with untreated pernicious anemia were given neutralized gastric juice, in exactly the manner detailed, with totally negative results. For the sake of brevity their detailed histories are omitted.

Sternal bone marrow studies in all five cases were done at frequent intervals during the periods of gastric juice feedings, and in no instance was the usual megaloblastic picture changed. The megaloblast-normoblast ratio remained unaltered throughout the experiments and was identical with that constantly seen in untreated pernicious anemia.

CONCLUSION

Feeding pernicious anemia patients the gastric juice of normal individuals, modified according to the technic of Greenspon, produces no subjective or objective improvement in the patient's condition. No evidence of increased erythropoiesis was observed, either in bone marrow or in circulating blood.

Clinical Notes, Suggestions and New Instruments

MULTIPLE SYMMETRICAL LIPOMATOSIS

J. K. MILLER, M.D., INGLESIDE, NEB.
Neuropathologist, Hastings State Hospital

Lipomas may occur anywhere within the body and have been found in the cranial cavity, the mediastinum, the uterus and the marrow cavity of the bones. Because of their wide distribution they have been classified as subcutaneous, intermuscular and visceral. The majority are located under the skin and occur most frequently on the trunk, thighs and arms. The face, scalp, sternal region, hands and lower legs are infrequent sites.

Pack and LeFevre,[1] in a study of 19,129 tumor cases, of which 2,564 were benign growths, found that lipomas included

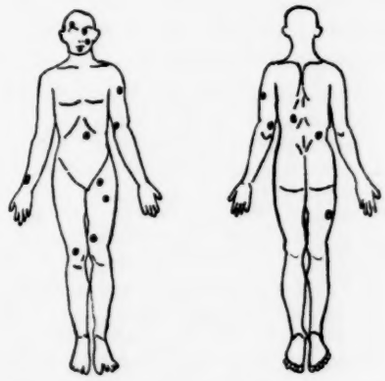


Fig. 1.—Multiple symmetrical lipomatosis: Distribution of the lipomas on the son, showing freedom of the hands and lower part of the legs and the presence of four tumors above the neck.

4.3 per cent of all benign tumors. Adair,[2] reporting the regional distribution of 352 lipomas in 134 patients, had a frequency of from 4 to 5 per cent of all benign tumors. Of these, nine cases (6.7 per cent) were multiple lipomas. Adair included a case presenting 160 distinct tumors. Of the 352 lipomas, only two

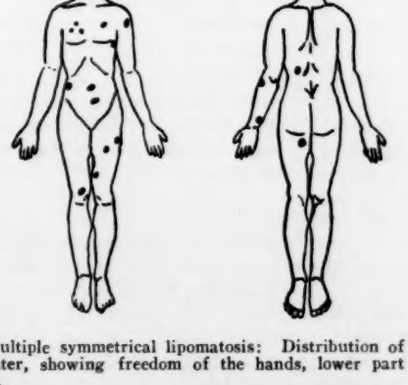


Fig. 2.—Multiple symmetrical lipomatosis: Distribution of the lipomas on the daughter, showing freedom of the hands, lower part of the legs and the head.

tumors were observed above the neck, two below the knees and two on the hands. Of the 134 patients, 101 were between the ages of 30 and 55; 42 per cent were in the decennium of 40-50 years. Females constituted approximately 75 per cent of the cases.

Adair differentiates between multiple lipomas and "congenital diffuse lipomatosis." The latter is confined to one or two limbs

From the Clinic of Dr. E. C. Foote, M.D., Hastings, Neb.

1. Pack, G. T., and LeFevre, R. G.: The Age and Sex Distribution and Incidence of Neoplastic Disease at the Memorial Hospital, J. Cancer Research **14**: 167-294 (June) 1930.

2. Adair, F. E.; Pack, G. T., and Farrior, J. H.: Lipomas, Am. J. Cancer **16**: 1104-1120 (Sept.) 1930.

and is usually associated with corresponding enlargement of muscles and bones of the same extremity. The multiple lipomas, Adair believes, are neurolipomas. They are not congenital but develop during adolescence and later life. Their frequent symmetrical distribution commonly confuses them with multiple neurofibromatosis. Adair presents a number of clinical similarities but, in suggesting a neurogenic origin for multiple lipomas, admits a lack of histologic evidence.

The etiology of symmetrical lipomatosis is obscure. Ewing [3] says: "It has not been possible to establish for lipomas such a relation to peripheral nerves as exists with fibromas." Adair has called attention to a number of writers who have linked the lipomas with neuropathies. Trauma and endocrine imbalance, particularly of the thyroid and pituitary, may be provocative agencies. Again, Ewing says that lipomas (multiple) "seem more closely connected with the forms of diffuse or regional overgrowths of fat tissues, which bear the same relation to lipomas as diffuse fibromatosis to fibromas." He believes that endocrine imbalance of the thyroid and pituitary may be an important factor. "A congenital tissue predisposition seems to be an essential factor in the origin of most lipomas." Moreira da Fonseca [4] qualifies multiple symmetrical lipomatosis as an "endocrinosympathetic syndrome," with emphasis on the pituitary.

A heredofamilial tendency in multiple lipomas is illustrated by the reported cases of Adair, Bonnefous and Valdiguié,[5] Cannon,[6] Esquier [7] and Leven.[8] Adair has one report of the condition extending through three generations.

REPORT OF CASES

The following three cases of multiple symmetrical lipomatosis were observed in a mother, a son and a daughter:

CASE 1.—The mother was a white woman, aged 63. At the age of 35 her menses suddenly ceased and in the following five years she began to note the appearance of small, soft tumors over her body. A few were noted on the lower part of the legs and many on the scalp. Most of the tumors were from 0.5 to 1 cm. in diameter and were frequently associated with pigmented nevi. The tumors were not painful or attached to the skin. The total number of tumors was too great for the patient to diagram accurately. Her son and daughter presented similar tumors the location of which is shown in the illustrations.

CASE 2.—The son, aged 34, at the age of 14 years was struck on the left cheek with a baseball, and three years later he noted a soft tumor over the area and a second soft tumor under the left upper eyelid. Coincidently a tumor appeared in the roof of the mouth. The oral tumor grew slowly but when the patient was 34 it had acquired the size of a hen's egg (3 cm. in diameter). The necessity for removal brought these three cases to the attention of the physician.

CASE 3.—The daughter, aged 36, first noted the tumors at the age of 26. Four years before admission she had one of the large abdominal tumors (5 cm. in diameter) removed. Biopsy revealed a lipoma. At the present time she gave no history of endocrine imbalance.

COMMENT

The son and daughter each presented seventeen lipomas and the distribution in the two cases was similar (figs. 1 and 2). No tumors were noted on the lower legs or on the hands. However, the son presented four tumors of the head and the mother presented numerous soft tumors of the scalp. The mother also showed a number of lipomas of the lower legs. A suggested endocrine imbalance is noted in the cessation of menses in the mother prior to the appearance of the tumors.

Histologic examination of the oral tumor from the son revealed a preponderance of fat cells of a mature type. However, the cytology was characterized by interlacing bundles of mature fibrous tissue. Although there was no histologic evidence of neurogenic origin, the distribution of the tumors in the son and daughter suggests a possible configuration following the peripheral nerve routes. A second tumor removed from the son showed a simple mature lipoma.

SUMMARY

Three cases of multiple symmetrical lipomatosis in a mother, son and daughter were observed. The tumors were noted in uncommon sites, namely, the head and lower part of the legs, on the mother and son. The distribution of the tumors on the son and daughter (seventeen in each case) was similar. Possible endocrine disturbance may have been an etiologic factor in the mother.

3. Ewing, James: Neoplastic Diseases, ed. 3, Philadelphia, W. B. Saunders Company, 1928, p. 191.

4. Moreira da Fonseca, Joaquim, cited in Symmetrical Lipomatosis, Rio de Janiero letter, J. A. M. A. **100:** 1879 (June 10) 1933.

5. Bonnefous, R., and Valdiguié, A.: Hypercholesterinemie et lipomatose, Zentralbl. f. Haut- u. Geschlechtskr. **14:** 174, 1924.

6. Cannon: Symmetical Lipomatosis, Zentralbl. f. Haut- u. Geschlechtskr. **25:** 454, 1927.

7. Esquier, A.: Lipomes sous-cutanés multiples chez un tirailleur dahomeen, Zentralbl. f. Haut- u. Geschlechtskr. **23:** 791, 1927.

8. Leven: Erblichkeit der multiplen Lipome, Dermat. Wchnschr. **87:** 1563-1565 (Oct. 6) 1928.

Special Article

DIPHTHERIA MORTALITY IN LARGE CITIES OF THE UNITED STATES IN 1935

THIRTEENTH ANNUAL REPORT

This report concerns the ninety-three cities dealt with in the recent article on typhoid;[1] the rates are calculated on the basis of the population figures used in that article. The number of diphtheria deaths in each city has been reported to us by the respective health departments.[2] Particulars as to the years that are included in the five year averages annotated as "incomplete data" are given in footnotes to tables 1-8 in our previous reports through 1931 and are itemized at the beginning of the article for 1932.

TABLE 1.—*Death Rates of Fourteen Cities in New England States from Diphtheria (Including Croup) per Hundred Thousand of Population*

	1935	1934	1930-1934	1925-1929	1920-1924	1915-1919	1910-1914	1905-1909	1900-1904	1895-1899	1890-1894
Bridgeport	0.0	0.7	1.0	11.8	19.6	23.4	23.3	26.8	34.2	63.9	79.3
Cambridge	0.0	0.0	1.2	3.2	8.9	12.9	23.8	25.3	46.7	71.9	58.0
Lynn	0.0	4.9	4.7	13.5	17.0	17.8	17.2	21.7	38.0	44.0	49.0
New Bedford	0.0‡	0.0	4.8	10.9	16.5	17.0	20.9	22.6	25.1	53.6	20.0
New Haven	0.0	0.0	0.5	1.6	7.1	14.2	14.9	22.7	15.6	54.8	74.5
Springfield	0.0	0.0	2.1	10.3	15.4	24.9	19.1	31.3	29.6	51.3	68.2
Waterbury	0.0	1.0	2.4	2.6	17.9	23.0	29.6	....	....	....	....
Worcester	0.5	1.0	2.9	8.6	15.5	14.1	21.3	32.2	16.5	50.3	47.8
Somerville	0.9	6.6	9.0	5.7	19.7	20.2	21.4	21.5	40.5	57.8	37.4
Providence	1.2†	0.4	5.0	9.5	15.8	29.3	26.8	30.7	41.2	53.5	55.3
Boston	1.3	1.1	3.2	8.3	20.2	26.3	20.0	26.2	53.7	83.9	112.2
Fall River	1.7‡	1.7	3.9	12.0	25.5	23.6	24.0	34.4	50.1	43.8	46.9
Lowell	4.0‡	15.0	9.4	10.6	16.7	23.5	20.6	31.0	59.3	44.3	36.4
Hartford	4.1†	0.6	1.1	5.3	11.9	13.8	25.3	28.1	38.8	47.8	120.9

† One third or more of the reported diphtheria deaths were stated to be in nonresidents.

‡ Rate computed from population as of April 1, 1930, as no estimate for July 1, 1933, was made by the Census Bureau.

The fourteen New England cities (table 1) again make an excellent showing; half of their number passed through the year without a single death from diph-

The preceding articles were published in THE JOURNAL, Sept. 20, 1924, p. 918; April 25, 1925, p. 1269; April 3, 1926, p. 1005; April 30, 1927, p. 1396; May 19, 1928, p. 1621; May 25, 1929, p. 759; June 7, 1930, p. 1838; May 23, 1931, p. 1768; May 7, 1932, p. 1644; May 20, 1933, p. 1595; May 26, 1934, p. 1758, and June 15, 1935, p. 2182.

1. Typhoid in the Large Cities of the United States in 1935, J. A. M. A. **106:** 1983 (June 6) 1936.

2. It should be noted that the figures include all deaths of diphtheria that have occurred within the city limits, of nonresidents as well as residents. In some instances this undoubtedly gives an exaggerated impression of the amount of diphtheria in a community, but at present statisticians are agreed that "the attempt to eliminate the deaths of nonresidents would often result in an understatement of the true mortality" (Bureau of the Census, Mortality Statistics, 1912, p. 13). Cities in which one third or more of the reported diphtheria deaths are stated to have occurred in nonresidents are indicated in tables 1-8. In 1935 there were twenty such cities. A further discussion of the problem of the nonresident in diphtheria statistics was given in the report covering the year 1931.

theria, a truly astonishing record. With the exception of Lowell, in which diphtheria mortality has been relatively high in recent years, and Hartford, where a considerable number of the reported diphtheria deaths occurred in nonresidents, no diphtheria death rate reached as high as 2.0. The registration of only

TABLE 2.—*Death Rates of Eighteen Cities in Middle Atlantic States from Diphtheria (Including Croup) per Hundred Thousand of Population*

	1935	1934	1930-1934	1925-1929	1920-1924	1915-1919	1910-1914	1905-1909	1900-1904	1895-1899	1890-1894
Albany	0.0	3.8	2.9	7.5	12.8	10.4	20.0	31.6	26.9	....	....
Erie	0.0	2.5	3.5	5.8	16.8	15.1	17.7	27.1	42.3	23.1	....
Reading	0.0	5.4	3.8	7.3	21.1	16.9	35.7	29.2	70.1	72.0	94.1
Rochester	0.0	0.3	0.7	7.5	16.9	12.7	22.1	32.4	32.3	45.9	96.6
Scranton	0.0¶	1.4	1.3	11.7	12.3	22.1	23.4	....	....	77.8‖	48.6‖
Syracuse	0.0	0.0	0.4	2.0	22.9	12.9	16.6	17.4	17.7	31.1	55.4
Utica	0.0	0.0	1.2	13.4#	....	....	....	....	....	....	....
Yonkers	0.0	0.7	0.6	10.4	17.0	17.7	25.3	....	....	....	....
Newark	0.2	0.2	3.0	14.5	9.7	14.6	23.3	30.1	46.7	79.1	110.4
New York	0.9	1.4	2.2	10.7	14.0	21.8	28.0	40.0	58.0	85.8	134.4
Buffalo	1.0†	1.0	4.8	9.1	24.0	27.3	22.0	18.4	24.8	53.5	60.9
Philadelphia	1.0	1.1	1.3	11.8	16.7	22.7	24.6	34.1	50.0	100.6	119.4
Paterson	1.4	4.3	6.3	9.1	18.5	13.5	16.1	25.5	52.9	111.8	145.4
Pittsburgh	1.5	5.4	5.0	11.5	20.1	22.3	29.3	20.4	36.9	32.9	86.4
Elizabeth	1.7†	0.0	4.5	13.2	19.2	19.3	14.8	51.7	42.4	60.5	79.3
Trenton	2.4†	0.8	2.7	4.4	7.3	8.8	12.8	15.8	23.6	12.7‖	89.7‖
Jersey City	4.1	3.4	6.0	11.5	18.4	21.0	23.2	32.6	57.9	85.4	108.6
Camden	5.0†	5.0	7.7	21.9	20.3	23.2	38.8	48.9	52.6	93.8	104.0

† One third or more of the reported diphtheria deaths were stated to be in nonresidents.
‖ Diphtheria deaths from Chapin's Municipal Sanitation.
Incomplete data.
¶ Diphtheria data for Scranton furnished by Pennsylvania Department of Health, Harrisburg.

TABLE 3.—*Death Rates of Nine Cities in South Atlantic States from Diphtheria (Including Croup) per Hundred Thousand of Population*

	1935	1934	1930-1934	1925-1929	1920-1924	1915-1919	1910-1914	1905-1909	1900-1904	1895-1899	1890-1894
Baltimore	0.7†	0.8	1.7	7.6	11.4	13.5	14.2	16.1	33.0	68.1	70.0
Richmond	1.1†	1.6	3.6	6.9	9.8	5.8	7.0	9.8	24.4	17.6	59.7
Jacksonville	2.2	7.2	5.4	6.0#	....	....	....	....	....	....	....
Norfolk	2.3	2.3	4.6	4.1	4.3	4.1	6.7	17.0	....	....	....
Wilmington	3.7	1.9	5.3	10.9	11.6	15.2	18.0	27.8	50.9	84.9	83.8
Washington	5.8	3.2	3.9	7.1	10.5	11.9	6.9	11.2	23.5	50.9	77.9
Miami	6.5	4.6	3.8	5.4#	....	....	....	....	....	....	....
Tampa	6.6†	2.8	4.8	4.6	5.2	9.5#	....	....	....	....	....
Atlanta	6.8†	7.5	5.7	7.0	13.3	10.1	12.5	14.2	11.1	10.5	8.8

† One third or more of the reported diphtheria deaths were stated to be in nonresidents.
‡ Rate computed from population as of April 1, 1930, as no estimate for July 1, 1933, was made by the Census Bureau.
# Incomplete data.

twenty-eight deaths from diphtheria in 1935 in the whole New England group (population 2,624,805) is remarkable (table 13). New Haven has easily borne off the palm since 1930 among the New England cities. It is tempting to attribute this freedom from the disease in New Haven to the high proportion of immunized children (65 per cent of children of preschool age and 80 per cent of school children). The city of Lowell, although still with more diphtheria than the average, shows marked improvement over 1934. Boston again has a very low rate for a city of its size.

The eighteen cities of the Middle Atlantic states (table 2) still rank as the best geographic group in the country as regards diphtheria mortality (table 13). Only three cities had a rate higher than 2.0 and eight of the eighteen had no diphtheria deaths, Syracuse for the third consecutive year. The Middle Atlantic cities are running a close race with the New England cities, the diphtheria rate for the group for 1935 (1.00) being only slightly lower than the New England group average (1.07); this was also the case in 1934 (Middle Atlantic 1.63, New England 1.68). Utica is said to have had only one case of diphtheria in 1935; 61 per cent of children under 5 years of age in that city have been given the immunizing treatment. Here also it is impossible to avoid the conclusion that the very large extent to which diphtheria immunization is practiced in the cities in this region is responsible for the marvelously low, and still declining, diphtheria death roll. New York records the lowest rate in its history (0.9) and Philadelphia, with a rate of 1.0, is on the same level. It is noteworthy that, of the nineteen cities in the United States reporting no diphtheria deaths in 1935 (table 10), fifteen are in the two geographic divisions just discussed (New England and Middle Atlantic).

The nine cities of the South Atlantic group (table 3) did not, on the whole, do as well in 1935 as in 1934, Wilmington, Washington, Miami and Tampa showing an increase in diphtheria mortality. Jacksonville alone in this group shows marked improvement. Baltimore has an exceptional record in this division. For a period

TABLE 4.—*Death Rates of Eighteen Cities in East North Central States from Diphtheria (Including Croup) per Hundred Thousand of Population*

	1935	1934	1930-1934	1925-1929	1920-1924	1915-1919	1910-1914	1905-1909	1900-1904	1895-1899	1890-1894
Evansville	0.0	3.8	3.2	3.7	13.9	14.9	16.1	21.2	13.8	18.1	69.7
Grand Rapids	0.6	0.0	0.3	2.0	19.6	13.5	20.0	26.6	17.2	32.4	99.2
Youngstown	0.6	0.6	3.3	10.5	18.5	11.9	40.5	33.5	28.0	17.6	28.4#
Detroit	0.7	0.7	4.8	19.7	24.3	32.2	33.3	22.6	38.5	62.9	132.9
Milwaukee	0.7	1.5	2.0	8.5	11.4	19.8	27.8	26.4	22.7	51.7	116.2
Toledo	0.7	2.0	2.8	7.2	22.4	14.1	25.4	20.4	56.8	34.6	89.3
Canton	0.9	0.0	1.7	2.9	17.5	15.1#	....	....	....	....	....
Cleveland	2.3	3.0	2.5	15.3	14.7	20.0	24.6	20.8	42.6	45.3	95.7
Chicago	2.4	1.2	4.3	11.7	17.5	31.2	37.9	27.0	33.9	69.7	117.3
South Bend	2.7	0.0	1.3	....	....	....	....	....	....	....	....
Columbus	3.3	4.0	3.2	4.6	8.5	7.6	12.1	10.5	11.6	28.5	56.9
Akron	4.1	5.3	2.7	4.9	10.4	18.9	27.8	21.8#	....	....	....
Cincinnati	4.1†	5.4	3.2	5.2	10.6	13.2	13.9	17.0	17.3	37.3	103.7
Indianapolis	5.6†	3.8	3.1	6.6	11.7	21.4	13.5	13.3	15.9	36.4‖	97.3#
Flint	6.0	2.4	2.7	4.5	29.9	25.5	12.7	11.0	16.8	6.9	69.2
Fort Wayne	6.7	2.5	3.3	5.1	13.1	6.3	....	....	....	....	....
Dayton	7.3	3.4	3.5	4.6	9.4	9.3	22.1	13.3	17.2	27.4	82.9
Peoria	12.7	2.7	5.3	4.9	7.4	10.8	10.6	10.4#	14.0	14.6	68.0

† One third or more of the reported diphtheria deaths were stated to be in nonresidents.
‖ Diphtheria deaths from Chapin's Municipal Sanitation.
Incomplete data.

TABLE 5.—*Death Rates of Six Cities in East South Central States from Diphtheria (Including Croup) per Hundred Thousand of Population*

	1935	1934	1930-1934	1925-1929	1920-1924	1915-1919	1910-1914	1905-1909	1900-1904	1895-1899	1890-1894
Memphis	2.7†	2.3	6.0	5.8	9.5	11.2	11.9	13.4	6.9	10.0	28.5
Birmingham	2.9	2.9	4.2	5.4	5.3	7.2	8.3	6.2	13.4	16.5	26.3
Chattanooga	4.0	9.7	6.8	5.9	8.7	8.9	....	....	....	....	....
Louisville	4.7	11.3	6.3	4.6	10.4	9.5	9.0	....	....	39.0‖	49.6#‖
Nashville	5.8†	8.3	8.2	11.8	8.0	8.9	7.3	10.3	13.9	30.1	28.4
Knoxville	13.6†	10.8	9.6	6.3	11.2	....	....	....	....	....	....

† One third or more of the reported diphtheria deaths were stated to be in nonresidents.
‖ Diphtheria deaths from Chapin's Municipal Sanitation.
Incomplete data.

of a year and sixteen days (Sept. 26, 1934, to Oct. 13, 1935) there was not a single resident diphtheria death. Here also the campaign for diphtheria prevention by immunization has been carried on actively, apparently with a high degree of success. What is the matter with the other cities along the South Atlantic seaboard? One would expect Washington to have as low a rate as

Baltimore, but the average diphtheria mortality for the last two years has been nearly ten times as great. Cities like Miami or Tampa, with a "good climate," ought certainly to bring their diphtheria rates down to a level with those of the cities in "bleak" New England and central New York.

The cities in the East North Central states (table 4) had a relatively poor diphtheria year, the divisional

TABLE 6.—*Death Rates of Nine Cities in West North Central States from Diphtheria (Including Croup) per Hundred Thousand of Population*

	1935	1934	1930-1934	1925-1929	1920-1924	1915-1919	1910-1914	1905-1909	1900-1904	1895-1899	1890-1894
Minneapolis	0.6	1.0	1.7	11.9	13.4	19.9	28.3	24.4	44.6	34.0	55.0
St. Paul	0.7†	0.7	1.1	5.2	17.5	20.7	31.4	31.1	27.9	43.3	75.4
Duluth	1.0	0.0	0.4	2.0	6.0	10.2	8.8	38.2	29.1	7.6	49.5
Kansas City, Mo.	2.2	2.2	3.2	4.7	14.4	22 8	15.7#	....	....	....	....
Kansas City, Kan.	2.4	4.9	3.7	4.6	9.8	23.1	12.4#	....	....	....	....
Wichita	2.5	2.5	4.6	4.2	....	....	....	....	....	....	....
St. Louis	2.9	4.6	4.3	10.3	16.1	24.4	23.7	19.4	43.3	62.9	67.7
Omaha	3.2	2.7	4.7	6.4	22.9	35.8	15.8	24.5	20.5	28.2	82.9
Des Moines	4.8	4.8	4.3	5.2	15.1	16.6	15.1	23.8#	....	....	....

† One third or more of the reported diphtheria deaths were stated to be in nonresidents.
# Incomplete data.

TABLE 7.—*Death Rates of Eight Cities in West South Central States from Diphtheria (Including Croup) per Hundred Thousand of Population*

	1935	1934	1930-1934	1925-1929	1920-1924	1915-1919	1910-1914	1905-1909	1900-1904	1895-1899	1890-1894
Oklahoma City	2.5	4.5	5.7	10.9	....	....	....	....	....	....	....
Tulsa	3.4	3.4	6.8	12.5	8.3#	....	....	....	....	....	....
El Paso	3.8	10.4	8.0	7.3	20.0	17.6	29.2	....	....	....	....
Houston	4.7	6.3	5.6	8.2	6.4	6.1	7.8	10.5	4.2#	2.4	1.8
New Orleans	5.5†	6.8	5.5	8.5	6.5	11.6	19.6	10.2	11.5	17.1	51.3
Dallas	6.5	6.5	9.7	9.8	8.3	7.4	6.9	8.1	16.9	16.0	21.8
Fort Worth	7.1	3.5	7.2	10.8	1.7#	2.6#	2.6	2.8	5.4	....	....
San Antonio	9.4	2.0	5.6	10.3	7.7	8.7	6.7	7.6	17.1	20.6	4.4

† One third or more of the reported diphtheria deaths were stated to be in nonresidents.
# Incomplete data.

TABLE 8.—*Death Rates of Eleven Cities in Mountain and Pacific States from Diphtheria (Including Croup) per Hundred Thousand of Population*

	1935	1934	1930-1934	1925-1929	1920-1924	1915-1919	1910-1914	1905-1909	1900-1904	1895-1899	1890-1894
Portland	0.0	0.6	1.3	6.4	11.3	6.0	12.3	12.2	20.2	....	....
Seattle	0.0	0.0	0.4	1.4	6.6	5.5	5.2	12.5	13.4#	27.2‖	....
Tacoma	0.0	0.9	3.9	9.3	12.4	7.7#	....	....	....	....	....
San Francisco	0.6	0.1	1.2	4.6	23.0	17.0	9.2	14.4	44.2	21.6	54.8
Salt Lake City	1.4†	0.0	0.3	10.1	12.5	14.5	15.1	34.2	46.0	14.8	56.7#
Spokane	1.7	0.0	0.7	7.5	11.3	4.2	7.6	25.8	....	59.5‖	18.1
Long Beach	1.9†	0.0	0.8	2.6	10.4#	....	....	....	....	....	....
San Diego	1.9	1.9	2.9	6.6	12.2	10.5	8.0	5.8	2.4	....	....
Los Angeles	2.8	3.0	4.8	7.0	14.4	7.1	7.5	15.3	25.4	35.8	46.0
Denver	4.8	4.4	3.9	8.9	23.2	6.7	10.2	20.8	29.6	27.3	130.2
Oakland	5.7†	2.7	2.0	7.4	18.8	8.1	10.3	16.1	29.1	....	....

† One third or more of the reported diphtheria deaths were stated to be in nonresidents.
‖ Diphtheria deaths from Chapin's Municipal Sanitation.
Incomplete data.

group rate rising from 1.89 in 1934 to 2.45 in 1935, an increase which suggests that renewed efforts in some communities should be made to bring about a general inoculation of children. Cincinnati is said to have had a high proportion of nonresident deaths (six to be credited to Kentucky and one each to Indiana and Ohio). The Peoria death rate from diphtheria was very high in the first six months of the year and it is stated that the improvement observed in the second six months was due to the general application of immunizing methods. It should not, however, be necessary to wait until a considerable number of children are attacked before general immunization is undertaken. The results of preventive inoculation are now so definite that there seems no longer any excuse for continued high diphtheria mortality in either Northern or Southern cities.

The East South Central cities (table 5) in 1935 show a marked group improvement (table 13) over 1934 in diphtheria mortality. This is particularly marked in Louisville, Chattanooga and Nashville. Knoxville and Memphis have not done so well. Knoxville, as will be seen in table 5, shows an increase in the quinquennial period 1930-1934 as compared with 1925-1929, and, if 1934 and 1935 are representative, there seems likely to be another increase for the current five year period. It appears in table 9 that Knoxville had the highest diphtheria rate in the United States for 1935. Even allowing for considerable diphtheria in the surrounding

TABLE 9.—*Ten Cities with Highest Diphtheria Rates for 1935*

Knoxville	13.6	Atlanta	6.8
Peoria	12.7	Fort Wayne	6.7
San Antonio	9.4	Tampa	6.6
Dayton	7.3	Dallas	6.5
Fort Worth	7.1	Miami	6.5

TABLE 10.—*Nineteen Cities with No Diphtheria Deaths in 1935*

Albany	Lynn	Rochester	Tacoma
Bridgeport	New Bedford	Scranton	Utica
Cambridge	New Haven	Seattle	Waterbury
Erie	Portland	Springfield	Yonkers
Evansville	Reading	Syracuse	

TABLE 11.—*Number of Cities with Various Diphtheria Death Rates*

	No. of Cities	40 and Over	20 and Over	10 and Over	5 and Over	Under 5	0.0
1890-1894	64	52	60	61	62	2	0
1895-1899	66	34	53	63	65	1	0
1900-1904	68	22	46	64	66	2	0
1905-1909	72	3	43	66	71	1	0
1910-1914	79	1	36	63	78	1	0
1915-1919	84	0	25	62	81	3	0
1920-1924	88	0	14	65	86	2	0
1925-1929	92	0	1	22	67	25	0
1930-1934	93	0	0	0	24	69	0
1934	93	0	0	4	17	76	15
1935	93	0	0	2	17	76	19

country, the rate is still far too high for any American city in view of our present knowledge of methods of combating this infection.

The death roll in the West North Central division (table 6) in 1935 shows some improvement over 1934; this is particularly marked in the case of St. Louis and Kansas City, Kansas. The St. Louis rate appears to be the lowest ever recorded by that municipality. This is true also for Minneapolis and St. Paul, with the relatively low rates of 0.6 and 0.7, respectively. Duluth seems to have been remarkably free from diphtheria for a number of years and is likely to hold its place in the present decade as the leader in the West North Central group; the disease is said to have practically disappeared from that city.

The West South Central states (table 13) remain in almost exactly the same position as in 1934, a slight increase from 5.48 to 5.58 being indicated. While Oklahoma City, El Paso, Houston and New Orleans (table 7) show a noteworthy diminution in diphtheria mortality, the decrease in El Paso being particularly

gratifying, Fort Worth and San Antonio are backsliders. The residents of these Southwestern cities may well ask themselves why they should lose five times as many of their children from diphtheria as residents in the New England and Middle Atlantic states.

The cities in the Mountain and Pacific states (table 8) experienced higher diphtheria mortality in 1935 than in 1934, the increase in Oakland being particularly striking. San Francisco had a good record, although not quite so amazing as in 1934.

TABLE 12.—*Total Diphtheria Death Rates for Eighty-Eight Cities, 1923-1935* **

	Population	Diphtheria Deaths	Diphtheria Death Rate per 100,000 Population
1923	31,060,848	4,078†	13.13
1924	31,722,841	3,439	10.84
1925	32,384,834	3,133	9.67
1926	33,046,827	3,106	9.40
1927	33,708,820	3,493	10.36
1928	34,370,813	3,176	9.24
1929	35,032,806	2,738	7.82
1930	35,694,802	1,827	5.12
1931	36,503,412	1,366	3.74
1932	37,084,712	1,191	3.21
1933	37,084,712	861	2.32
1934	36,777,112	821	2.23‡
1935	36,777,112	764	2.08‡

* The five following cities are omitted from this summary because data for the full period are not available: Jacksonville, Miami, Oklahoma City, South Bend and Utica.

† Data for Fort Worth lacking.

‡ The rate for the ninety-three cities in 1935 is 2.09 (population 37,437,812, diphtheria deaths 782). The corresponding rate for 1934 was 2.26 and the average for 1930-1934 was 3.34.

As appears in table 11, the number of cities with diphtheria death rates over 10 decreased from four in 1934 to two in 1935 and those with no diphtheria deaths increased from fifteen to nineteen. For the eighty-eight cities in our tables (table 12), the number of diphtheria deaths reported in 1935 was 764 as compared with 821 in 1934 and 3,133 in 1925, ten years ago. The rate for the whole population was probably definitely lower in 1935 than in 1934, but, since population estimates at the present time are tentative, the actual figures given in table 12 are of course only approximations.

TABLE 13.—*Total Diphtheria Death Rates per Hundred Thousand of Population for Ninety-Three Cities According to Geographic Divisions*

	(1933) Population	Diphtheria Deaths		Diphtheria Death Rates			
		1935	1934	1935	1934	1930-1934	1925-1929
New England	2,624,805	28	44	1.07	1.68	3.38	8.34
Middle Atlantic	12,952,300	129	211	1.00	1.63	2.50	9.97
South Atlantic	2,367,307	80	70	3.38	2.96	3.54	7.37*
East North Central	9,643,100	236	182	2.45	1.89	3.66	11.21†
East South Central	1,242,600	59	87	4.75	7.00	6.36	6.34
West North Central	2,704,500	59	76	2.18	2.81	3.22	7.82
West South Central	1,934,800	108	106	5.58	5.48	6.55	9.24‡
Mountain and Pacific	3,968,400	83	69	2.09	1.74	2.69	6.28

* Lacks data for 1925 for Jacksonville and Miami.

† Lacks data for South Bend.

‡ Lacks data for Oklahoma City for 1925 and 1926.

The striking feature in the 1935 diphtheria record appears to be that wherever preventive inoculation against diphtheria is practiced consistently diphtheria deaths well-nigh cease to occur, and in some communities diphtheria morbidity is also reduced to an insignificant figure. It is to be hoped that all communities will soon come to realize what can be done in the matter of diphtheria prevention.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING ARTICLE. HOWARD A. CARTER, Secretary.

HEATING OF HUMAN TISSUES BY SHORT WAVE DIATHERMY

JOHN S. COULTER, M.D.
AND
HOWARD A. CARTER, B.S. IN M.E.
CHICAGO

In heating human tissues by short wave diathermy, claims have been made that certain wavelengths are more effective than others. A survey of current literature reveals many opinions. Apparently none of the authors have investigated the heating effects of different frequencies of short wave diathermy energy on living tissues of the human thigh. There are many references to heating of dead tissues and agar agar solutions.

Schereschewsky,[1] in his studies of dead tissues, found that a 4.69 meter wavelength had a greater heating effect on muscle than a 1 meter wavelength.

Schliephake [2] performed his experiments by placing pieces of individual tissues of equal size in the condenser field, at the same time taking care to keep the field strength as constant as possible. Amputated arms and legs likewise were used. He investigated wavelengths ranging from 3.5 meters to 14 meters, employing seventeen different wavelengths in all. He concluded that the heating of individual tissues in a unit of time varied when energy of certain wavelengths was used. When treating dead pieces of tissue he observed that the fat was usually strongly heated, although the absolute height of the temperature varied. Animal fat gave different values from human fat. Furthermore, fatty tissues of different men gave different values. Schliephake's explanation for this was that fat is a storehouse for various kinds of minerals. Schliephake stated that, in a leg examined by him, the maximum heating of fat was obtained with 14.5 meters and the minimum with 7 meters. He further stated that there was quite commonly a decrease in the heating effect on all kinds of tissues when wavelengths of 17 meters were exceeded.

Gebbert,[3] as quoted by Kowarschik,[4] found the heating of fat and muscle the same with wavelengths from 3 meters to 16 meters in his study of the influence of different wavelengths from a condenser field on the heating of muscle, bone, fat and bone marrow (dead tissue).

Bachem [5] used 3.5, 5, 7 and 15 meter wavelengths in his studies on dead tissues. With these wavelengths there was little difference in the heating effect in the muscle of the dead tissues. He found that the strongest heating of the subcutaneous fat was observed with the 5 meter wavelength, which gave a comparative temperature increase of 4 degrees C., while the 15 meter gave about 2.2 degrees C.

Schliephake [2] gave heating curves for muscles close to the bones, the medial muscles, and the boundary

1. Schereschewsky, J. W.: Heating Effect of Very High Frequency Condenser Fields on Organic Fluids and Tissues, Pub. Health Rep. **48**: 844-858 (July 21) 1933.
2. Schliephake, E.: Short Wave Therapy, London, Actinic Press, Ltd., 1935.
3. Gebbert, A.: Der Einfluss der Wellenlange auf die Warmeverteilung im Korper bei Ultrakurzwellentherapie, Klin. Wchnschr. **13**: 1563-1565 (Nov. 3) 1934.
4. Kowarschik, Josef: Kurzwellentherapie, Vienna, Julius Springer, 1936.
5. Bachem, A.: Selective Heat Production by Ultrashort Waves, Arch. Phys. Therapy **16**: 645-650 (Nov.) 1935.

between subcutaneous fat and muscles. The maximum heating for these tissues was observed at 14 or 15 meter wavelengths, and the minimum at 7 meters.

Holzer and Weissenberg,[6] in their work on dead tissues, showed that there was approximately 200 watts more heating with a 20 meter wavelength than with 10 meters when calculating the heat production in watts per ampere for cubic centimeters of tissue.

In the heating of dead human tissues it is possible to obtain different heating effects with energy at different wavelengths, but there is a considerable difference in the opinion of the investigators about the heating of fat and muscle. Schliephake noted that the maximum heating of fat was at 14.5 meters and the minimum at 7 meters. Gebbert observed no difference between 3 meters and 16 meters. Bachem found the greatest heating at 5 meters.

In the heating of muscle, Schereschewsky noted that there was a greater heating with a 4.69 meter wave than with 1 meter. Gebbert observed no difference between 3 meters and 16 meters. Schliephake noted that the maximum heating of muscle was at 14.5 meters. Holzer and Weissenberg found a greater heating of muscle at 20 meters than at 10 meters.

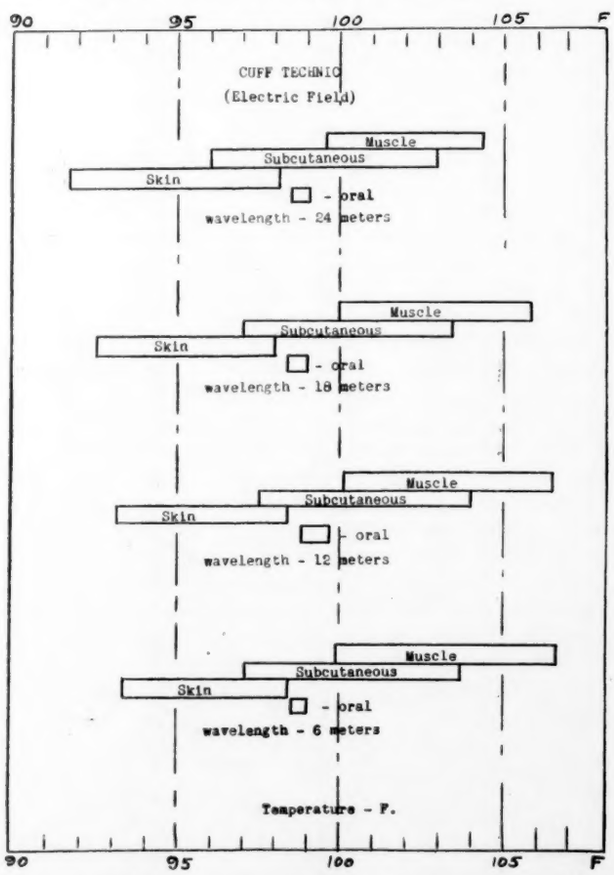


Chart 1.—Relation between wavelength and temperature with cuff electrode method.

In reviewing the aforementioned results, we can agree with Schliephake in his statement "From the results obtained on parts of dead bodies, we cannot conclude as to the results on living human beings," and with Kowarschik,[4] who states that unfortunately we do not know the electrical constants for most tissues and that what is known is very questionable.

Our investigation was undertaken because, apparently, there were no records in literature of heating living human tissues by short wave diathermy machines of different wavelengths. Therefore, this study was made to determine the heating efficacy of short wave diathermy in living human fat and muscle of the thigh, employing, first, an electric field of 6, 12, 18 and 24 meter wavelengths, using the cuff electrode technic;

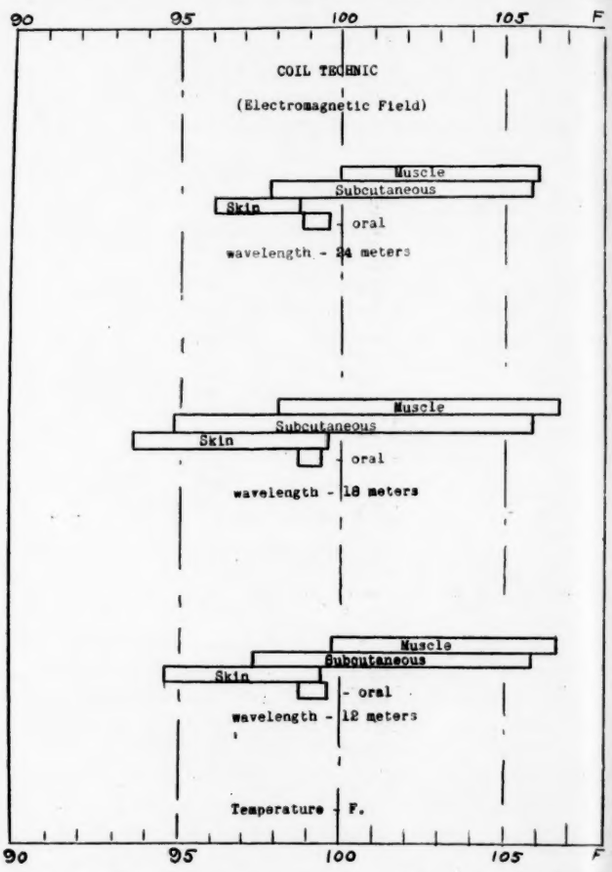


Chart 2.—Relation between wavelength and temperature with coil technic.

secondly, an electromagnetic field of 12, 18 and 24 meter wavelengths, using the coil technic. The cuff electrode of the electric field and the coil of the electromagnetic field were selected because previous work by Mortimer and Osborne[7] showed these methods of application to be the most effective of those in general use for heating tissues.

The machine used in these tests was so designed that the oscillator circuit could be interchanged, thus giving the range of wavelengths aforementioned. Furthermore, arrangements were made for application by either electromagnetic or electric field technics. Temperatures were taken by three thermocouples made of copper and constantan wires (28 gage Leeds-Northrup double cotton covered), soldered into the tip of a 16 gage lumbar puncture needle. The thermocouples were connected to the potentiometer (Leeds-Northrup portable precision type) through parallel double pole switches, a method that facilitated rapid reading of the individual couple.

The thermocouples were calibrated against a Bureau of Standards calibrated thermometer with scale division in one-tenth degree Fahrenheit. Since the thermocouple

6. Holzer, Wolfgang, and Weissenberg, E.: Foundations of Short Wave Therapy, London, Hutchinson's Scientific and Technical Publications, 1936.

7. Mortimer, Bernard, and Osborne, S. L.: Tissue Heating by Short Wave Diathermy: Some Biologic Observations, J. A. M. A. **104**: 1413 (April 20) 1935.

itself was affected by the high frequency currents, there were no thermocouples in place in the field during the passage of the current.

The six human subjects were medical students who volunteered for these tests. Under aseptic precautions, a nonmagnetic nonconducting sheath (through which the thermocouple needle could be guided for temperature readings) was inserted subcutaneously and into the quadriceps extensor muscle. Temperatures of the skin, of the subcutaneous tissue, of the muscle and of the mouth were taken before and after a twenty-minute clinical application. The temperature of the patient was permitted to return to normal after each test.

The intensity of the current was governed by the patient's tolerance; that is to say, the subject agreed to stand as much of the current as was possible without suffering discomfort.

The size of the cuff was approximately 18 inches by 3 inches. One cuff was wrapped around the proximal part of the thigh and the other around the distal part of the thigh. The distance between the edges of the cuffs was about 6 to 8 inches. Under the cuffs, padding consisting of three thicknesses of felt and toweling was used. Under the four turns of coil there was one-half inch of felt padding.

Summation of Results

Wavelength	Deep High Muscles Temperature			Subcutaneous Temperature			Skin Temperature			Oral Temperature		
	Initial	Final	Rise	Initial	Final	Rise	Initial	Final	Rise	Initial	Final	Rise
Cuff Technic, Electric Field												
24	99.55	104.27	4.72	95.85	102.85	7.00	91.73	98.20	6.47	98.53	99.03	0.50
18	100.05	105.73	5.68	97.03	103.35	6.32	92.52	97.98	5.46	98.35	99.08	0.73
12	100.13	106.45	6.32	97.48	103.98	6.50	93.13	98.42	5.29	98.80	99.66	0.86
6	99.93	106.58	6.65	97.12	103.68	6.56	93.33	98.40	5.07	98.50	99.07	0.57
Coil Technic, Electromagnetic Field												
24	99.97	106.05	6.08	97.72	105.85	8.13	96.08	98.71	2.63	98.77	99.60	0.83
18	97.98	106.72	8.74	94.82	105.77	10.95	93.62	99.58	5.96	98.70	99.35	0.65
12	99.73	106.60	6.87	97.33	105.83	8.50	94.55	99.37	4.82	98.67	99.60	0.93

A summation of the results is given in the accompanying table. It shows the initial and final temperatures and also the temperature rises. The results are the average of six observations at each wavelength.

Chart 1 shows the relation between wavelength and temperature with the cuff electrode method.

Chart 2 shows the relation between wavelength and temperature with the coil technic.

The power input of these machines ranged from approximately 400 to 800 watts. There did not appear to be any satisfactory method of measuring the output in terms of electrical units. Several methods have been suggested to measure output, but not one of them faithfully records the amount of power used by the patient undergoing treatment.

A discussion of the probable sources of error in observations seems advisable. With our potentiometer-thermocouple hookup the temperature could be read to an accuracy of 0.2 degree Fahrenheit. Although the surgeon was able to place the cannula fairly accurately in the quadriceps extensor muscle, the placing of the cannula for observing subcutaneous temperatures was not so easily accomplished. The depth below the skin of the inner end of the cannula varied as much as 3 or 4 mm. in the six subjects. This unavoidable inaccuracy may be one reason for the slight differences of reading from subject to subject, especially in the subcutaneous temperature readings.

The average initial subcutaneous temperature observed with the 18 meter wavelength, using the coil technic of the electromagnetic method, was lower than comparable initial temperatures of other wavelengths. Scrubbing with soap, applying disinfectants and injecting the anesthetic preparatory to inserting the cannula made the thigh cooler for the first observation than for the six subsequent observations. In the initial average temperature of the 18 meter wavelength, two of these first or low temperature readings were included instead of one reading as in the other averages. This explains the low initial average temperature of the 18 meter subcutaneous temperature readings of the electromagnetic field. Each final temperature reading was within the experimental error of the average of the six observations; hence these readings are regarded as more significant.

A practical and social problem becoming more and more important is the interference of short wave diathermy energy with radio communications. Mimno [8] reported that radio interference originating in a standard commercial short wave diathermy machine near the Harvard campus was picked up at the Naval Laboratory, Bellevue, D. C. The automatic keyed signals on 11.8 kilocycles (25.4 meters wavelength) were broadcast by a short wave diathermy machine which was not equipped with an antenna, the high frequency radiation being fed back unintentionally through the power supply line. An interesting observation made by him was that the signals were hardly audible several miles from the source but were of good signal strength at the Naval Laboratory. This apparently affords proof of the fact that the radio wave was strongly reflected by the ionized regions of the upper atmosphere.

Two remedies have been proposed: one [9] is the allocation of a special wavelength band for therapeutic purposes and the other is the proper screening of short wave diathermy machines and equipment. If, in subsequent investigations, a single frequency was found to be satisfactory for all treatments, the oscillators would have to be stabilized so that deviation of no more than a kilocycle from this assigned frequency would ever occur. Short wave diathermy machines would have to be manufactured with a frequency stability corresponding to a good radio transmitter. This remedy would necessarily increase the original cost and the maintenance expense. If the second remedy should be adopted, radio-frequency filters or wave traps would have to be inserted in the power leads to prevent reradiation of the high frequency energy back into the power mains, and the treatment room would have to be screened and grounded. The additional expense of this installation would increase the original cost of the

8. Mimno, H. R.: Interference Source Discovered, Electronics, February 1936, p. 19.

9. Short Wave Diathermy—"The Shadow," editorial, J. A. M. A. **106**: 1094 (March 28) 1936.

machine. Because of the ever increasing need for radio communication channels, it would seem that the method of screening and line filtering takes precedence over the allocation of a wave band for therapeutic purposes.

CONCLUSION

In the heating of live human muscle and fat there were no significant differences in the use of 6, 12, 18 and 24 meter wavelengths when using the cuff technic of the electric field method and no significant differences in the use of 12, 18 and 24 meter wavelengths when using the coil technic of the electromagnetic field method.

Committee on Foods

THE COMMITTEE ON FOODS HAS HAD BEFORE IT THE PERPLEXING PROBLEM OF THE VITAMIN D FORTIFICATION OF MILK. A STUDY WAS UNDERTAKEN BY DR. PHILIP C. JEANS, AT THE SUGGESTION OF THE COMMITTEE, FOR THE PURPOSE OF OBTAINING CERTAIN FACTUAL DATA THAT MIGHT AID THE COMMITTEE IN THE FORMULATION OF FUTURE POLICIES. DR. JEANS HAS PRESENTED TO THE COMMITTEE ON FOODS A REVIEW OF THE LITERATURE ON THE SUBJECT. BECAUSE OF THE VALUABLE MATERIAL IN THE REVIEW, THE COMMITTEE ON FOODS HAS AUTHORIZED PUBLICATION OF THE REPORT WITH THE VIEW OF AIDING PHYSICIANS, THE PUBLIC AND THE MILK INDUSTRY TO A BETTER UNDERSTANDING OF THE PROBLEM. IN SO DOING, THE COMMITTEE TAKES OPPORTUNITY TO EXPRESS ITS GRATEFUL APPRECIATION TO DR. JEANS FOR THE TIME HE HAS DEVOTED TO THE SUBJECT AND FOR THE PREPARATION OF THIS REPORT.

FRANKLIN C. BING, Secretary.

VITAMIN D MILK

THE RELATIVE VALUE OF DIFFERENT VARIETIES OF VITAMIN D MILK FOR INFANTS: A CRITICAL INTERPRETATIVE REVIEW

PHILIP C. JEANS, M.D.
IOWA CITY

In this presentation an attempt is made to evaluate in relation to the human infant the relative potencies of the different varieties of vitamin D [1] as found commercially in vitamin D milks. Orientation in this endeavor is aided by a brief consideration of the relative values as determined for the experimental animal.

EXPERIMENTAL WORK WITH ANIMALS

The animals used chiefly are the rat and the chick. The lesser potency of irradiated ergosterol as compared to cod liver oil has been established beyond any reasonable doubt when these two materials are fed on an equal rat unit basis in experiments with the chicken. The numerical difference found depends chiefly on dietary and other variants in the experiments with chickens and has varied somewhat with different observers. The report of Bethke, Record and Kennard,[2] which includes a brief review of preceding studies, seems to establish the ratio of efficacy of cod liver oil to irradiated ergosterol at 1:15 to 20.

On the basis of rat unitage it has been found that cod liver oil, irradiated milk and irradiated cholesterol are of equal value to the chicken.[3] Calciferol [4] (a crystalline vitamin D) irradiated yeast [4] and milk from cows fed irradiated yeast [5] have been found of the same relative value for the chicken as irradiated ergosterol. Apparently the cow, as also very definitely the chicken, does not change the biologic form of the vitamin when it makes the vitamin D available for the use of the offspring in the milk or the egg.[6]

Thus it is evident that at least two, and possibly only two, varieties of vitamin D exist. Purely laboratory products, formed neither in nature nor by the action of ultraviolet radiation, are not considered here. The products mentioned in the preceding discussion fall into two groups when considered in relation to their source. Those of animal origin are of one and equal value to the chicken; those of vegetable origin are of another value, also equal within the group. The differences between the two groups may depend on the relationship of vitamin D to cholesterol in one group and to ergosterol in the other group.

It is desirable to state that the relative position of "yeast milk" (milk from cows fed irradiated yeast) in the group of vitamin D materials named is not as clear as that of the other substances. Haman and Steenbock [7] found cod liver oil and also irradiated milk to be at least ten times as effective as "yeast milk." Bethke and his co-workers [8] found these materials to be "more than ten times" as effective as "yeast milk." In neither Bethke's nor Steenbock's experiment was the relative effectiveness of irradiated ergosterol determined. Older experiments indicate that the ratio of effectiveness of cod liver oil to irradiated ergosterol is 1:15 to 20 or more. No data have been found which permit a direct comparison of "yeast milk" with either irradiated ergosterol or irradiated yeast. In his paper Bethke states his belief that "yeast milk" is of the same value as irradiated yeast and elsewhere [9] he attributes the apparent discrepancy chiefly to the basal ration used.

Bills [10] has reported that the vitamin D of the liver oil of the blue fin tuna fish has for the chicken from one-sixth to one-seventh the potency of cod liver oil. Whether tuna liver oil contains a third variety of vitamin D is an unanswered question. Though an understanding of the problem raised by this observation is highly desirable, the finding seems to have no direct bearing on the evaluation of any of the vitamin D milks now produced and marketed.

APPLICATION TO MAN OF RESULTS WITH ANIMALS

No agreement has been reached concerning the relation of the human being to the rat and the chicken as regards reaction to vitamin D. Regardless of what may be this position, it would not be surprising to find that all vitamin D of animal origin has a similar potency and all vitamin D of vegetable origin another potency.

Let it be assumed for the purpose of illustration in discussion that the ratio of effectiveness of cod liver oil as compared to irradiated ergosterol on a rat unit basis is 1:1.5 for the human being; that all vitamin D of animal origin has the same value as cod liver oil, and that all vitamin D of vegetable origin has the same value as irradiated ergosterol. Such a relatively small difference may be difficult to detect by any but the most carefully controlled clinical experiments. If the minimum rickets-preventing intake of vitamin D of animal origin should be 70 units and that for vitamin D of

1. In all instances amounts of vitamin D are stated in terms of U. S. P. units (U. S. P. X Revised 1934).
2. Bethke, R. M.; Record, P. R., and Kennard, D. C.: J. Nutrition **6**: 413 (Sept.) 1933.
3. Waddell, J.: J. Biol. Chem. **105**: 711 (July) 1934. Bethke, Record and Wilder.[4] Haman and Steenbock.[7]
4. Bethke, R. M.; Record, P. R., and Wilder, O. H. M.: J. Biol. Chem. **112**: 231 (Dec) 1935
5. Haman and Steenbock.[7] Bethke, Krauss, Record and Wilder.[8]
6. Waddell.[3] Bethke, Krauss, Record and Wilder.[8]
7. Haman, R. W., and Steenbock, Harry: J. Nutrition **10**: 653 (Dec.) 1935.
8. Bethke, R. M.; Krauss, W. E.; Record, P. R., and Wilder, O. H. M.: J. Nutrition **11**: 21 (Jan.) 1936.
9. Bethke, R. M.: Personal communication to the author.
10. Bills, C. E.; Massengale, O. N., and Imboden, Miriam: Science **80**: 596 (Dec. 21) 1934.

vegetable origin 105 units, and if both vitamins D should be fed at a level of 105 units or more, the two products might appear to be of equal value, depending on the criteria used. Though the ratio of effectiveness and the minimum preventive doses stated may not be acceptable, the fallacy inherent in comparisons above the minimal effective level seems obvious unless the criteria of comparison extend beyond the mere prevention of rickets and include other factors influenced by vitamin D, which are discussed subsequently.

Accurate determinations of differences in vitamin D activity are associated with many difficulties even with the most rigid control possible with experimental animals. The difficulties are greatly increased in clinical studies; the differences in vitamin D activity apparently are much smaller, and strict control is not easily attained, especially in outpatient studies. Considering these factors and the individual variation among infants, it is not surprising that conflicting reports to the point of confusion have resulted from clinical experiments.

PREVENTIVE VERSUS CURATIVE STUDIES

Both preventive and curative studies are useful in comparing antirachitic agents. The presence or absence of rickets depends on the relative rate of growth and the intakes of calcium, phosphorus and vitamin D. In either a preventive or a curative study it is obvious that one cannot alter all these factors and still have a basis of comparison for one of them. In a curative experiment the time factor in healing and whether the healing is partial or complete are of especial importance. Bills[11] has shown that the time required for healing is not directly proportionate to the amount of vitamin D. In rats the production of 2 plus healing in three days requires 105 times and in five days 4.5 times as much vitamin D as is required to produce the same amount of healing in ten days. Apparently one may obtain a slight degree of healing with amounts of vitamin D smaller than a preventive dose. Bethke[12] has reported experiments wherein a degree of calcification was produced in rachitic rats from amounts of vitamin D insufficient for prophylaxis with the same diet. Russell,[13] as a result of experimental observations, states that "the unit or 1 plus level, determined curatively, affords only partial protection when fed on a preventive basis." It seems to require about 0.5 unit daily to prevent rickets in rats given the Steenbock diet 2965,[14] while it requires only about 0.27 unit daily for eight days to cause the amount of healing in ten days accepted as a standard in the Steenbock technic. However, it must be recognized that the minimum preventive dose and the dose which will produce ultimate complete healing may be the same, and that for rapid healing the dose must be larger than the preventive dose. It seems probable that, the greater the degree of rickets, the smaller the amount of vitamin D required to produce a slight degree of healing. Two plus healing is generally considered as representing a substantial increment of recalcification. This has not been found to be true for the rat.[14] Apparently 2 plus healing can occur with a bone ash increase of less than 1 per cent as compared to controls. If the same conditions hold for infants as have been found for rats as regards the correlation of the roentgenogram with the bone ash increase, healing studies concern themselves largely with exceedingly variable and almost insignificant calcification, except when marked and rapid healing is recorded. All the factors enumerated make curative studies difficult to evaluate. For comparison it is essential that they be conducted with the various influencing factors on a common basis.

OUTPATIENT VERSUS INPATIENT STUDIES

Outpatient studies are necessary in order to obtain experimental material in volume, but such studies have inherent weaknesses which are difficult to overcome. Except for detection of gross differences, outpatient studies are rarely conclusive as regards quantitative comparisons. In inpatient studies the environment of all the infants is the same and presumably the intake of food of each infant can be more definitely determined and controlled than is possible even in a well conducted outpatient study. Certain types of quantitative study are possible only with inpatients.

QUANTITATIVE VERSUS QUALITATIVE STUDIES

The term quantitative as here employed implies the accurate measurement of a considerable number of factors related to the question to be answered by the experiment. These measurements in the case of vitamin D milk studies might include the intake of food and vitamin D, the body growth, periodic estimates of the calcium and phosphorus of the blood, and by balance studies the determinations of retentions of calcium, phosphorus and nitrogen. The inclusion of all these, especially of balance studies, limits greatly the number of children who can be observed at one time. Such studies are useful in determining trends, which serve as guides in the observation of larger and more loosely organized groups. It seems fair to state that each of the quantitative items mentioned adds to the ease of interpretation and therefore to the value of reported studies. In the review of the literature of vitamin D milks it was especially noticeable that chemical studies were a great aid in evaluating the clinical data. Serum calcium and phosphorus determinations are as valuable in preventive as in curative studies, though in each type of study some interpretation may be required. Chemical data constitute criteria that are wholly objective, whereas roentgenograms can be recorded satisfactorily in a publication only in terms of interpretation.

PREVENTION OR CURE OF RICKETS AS A CRITERION OF ADEQUACY OF VITAMIN D

Both the prevention and the cure of rickets may be used as criteria for comparing the relative efficacy of various forms of vitamin D. The trend of the literature, however, is to consider that the minimal amount of vitamin D which will prevent or ultimately cure rickets is an adequate amount for the infant. This concept is probably incorrect and may be considered as comparable to the conclusion that prevention of xerophthalmia is evidence of adequate intake of vitamin A. Evidence for this contention is presented in succeeding paragraphs.

THE RELATION OF VITAMIN D TO CALCIUM RETENTION

Criticisms of the utility of calcium retentions have been stated on the basis of wide variations shown by individual babies or even by the same babies on different occasions. It was pointed out by Stearns[15] that

11. Bills, C. E.; Honeywell, Edna M.; Wirick, Alice M., and Nussmeier, Mildred: J. Biol. Chem. **90**: 619 (Feb.) 1931.
12. Bethke, R. M.; Kennard, D. C., and Sassaman, H. L.: J. Biol. Chem. **72**: 702 (April) 1927.
13. Russell, W. C.; Taylor, M. W., and Wilcox, D. E.: J. Nutrition **9**: 569 (May) 1935.
14. Zucker, T. F.: Science, to be published.
15. Stearns, Genevieve, and Jeans, P. C.: J. Biol. Chem. **114**: c (May) 1936.

the calcium retention by babies receiving little or no vitamin D has a wide range. Some retention is very good, other retention poor. As the intake of vitamin D is increased the average retention of calcium per kilogram is increased for any given per kilogram intake and the range of observed retentions narrows. The chief result of increased vitamin D seems to be in increasing the average level of retention of each infant to that of the best retention obtained without added vitamin D and in narrowing the range of retentions found. Thus it would seem that the range of variation is relatively narrow when effective amounts of vitamin D are given and that a wide range is characteristic of small or negligible amounts of vitamin D. When interpreted in the light of this discussion, balance experiments permit results which are reproducible with regularity.

A level of vitamin D which barely prevents rickets, such as vitamin D milk with 135 units to the quart, permits average calcium retentions definitely lower than those obtained with 400 unit milk or with one teaspoonful of cod liver oil.[16] If an amount of vitamin D which merely prevents rickets does not permit what are considered to be optimal retentions of calcium, rickets prevention cannot be accepted as a criterion of the adequacy of vitamin D intake. The difficulty here lies in the incomplete knowledge of what constitutes an optimal retention. However, probably few physicians would consider that any retentions obtained with one teaspoonful of cod liver oil daily are excessive; the amount of cod liver oil which prevents rickets seems to be approximately one third of this amount. Actual retentions with these amounts of vitamin D are stated subsequently.

THE RELATION OF VITAMIN D TO GROWTH

A certain few nutritional essentials have acquired the designation of "growth promoting." It is well recognized, however, that growth is retarded by deprivation of several materials not commonly designated in this fashion. The importance of calcium in growth has been demonstrated abundantly for animals.[17] To the extent that this finding applies to the human being and to the extent that vitamin D aids in calcium utilization, vitamin D is important for growth. Little has appeared in the literature concerning the relation of calcium to growth in man. Two reports by Jeans and Stearns[15] suggest the possibility that such a relationship exists. Daniels and her co-workers[18] found that infants receiving cod liver oil had a greater rate of growth than infants receiving the same diet without cod liver oil; the increased growth was attributed to vitamin D rather than to vitamin A. If a relationship actually exists between growth and vitamin D and if the amount of vitamin D which barely prevents rickets does not permit excellent growth, rickets prevention cannot be accepted as a criterion of adequacy of vitamin D intake.

It seems probable that a fallacy exists in considering growth as excellent when it merely falls within the limits of average growth by the usual standards such as those of Stuart or Kornfeld. Averages are made up of data from children who have received good, poor and indifferent nutritional care. Normal or excellent growth should be judged on the basis of what children will do when the nutritional factors that promote growth are favorable. The question as to whether growth curves at the upper limits of the average range represent really superior or optimal growth is not easily answered, but at least it is reasonable to think of it as superior on the basis of the factors mentioned in this discussion. One of the conclusions reached by Daniels[18] in a growth study is that the accepted standards of growth for infants are too low.

THE DIAGNOSIS OF RICKETS

Very brief reference to the literature[19] is all that is necessary to show that the clinical diagnosis of rickets (without roentgenograms) is unreliable and that great disagreement exists between the clinical diagnoses of various observers as well as between the clinical and roentgenographic diagnoses of the same observer. Logic favors the view expressed by Eliot,[20] who stated that "doubt is thrown on the reliability of clinical diagnoses of mild rickets in the absence of roentgenographic evidence of the disease." It would seem safe to take the stand that the clinical diagnosis of slight or mild rickets is not acceptable as evidence of this disease.

Reference to the literature[19] also makes obvious the conclusion that the criteria of roentgen diagnosis are not the same among those conceded to be expert in this field. A contrast is to be noted between Hess's 15 per cent incidence of rickets in a group selected at random and the 63 per cent or more in Eliot's group under good care and receiving vitamin D from two sources.

In further illustration of the variation in interpretation of roentgenograms of epiphyses of infants by different observers, the following experience is cited:[21] A series of roentgenograms of the wrist of each of twenty-five infants was used as the basis of an inquiry. This series of roentgenograms was obtained from three groups of infants who had been studied quantitatively; the intakes of milk and of vitamin D were known, the calcium and phosphorus retentions had been studied throughout the major part of infancy, the levels of calcium and of phosphorus in the serum had been determined at intervals, and accurate records had been kept of growth, dentition and motor achievement. The infants of groups 1 and 2 had been given whole acidified fresh or evaporated milk respectively and had received 340 units of vitamin D daily (an average of 50 units per kilogram), together with orange juice, sieved vegetables and fruits. The babies of group 3 received the same foods as those of the first two groups but only from 60 to 135 units of vitamin D a day (an average of 15 units per kilogram).

The serum calcium and phosphorus values in all three groups were normal; i. e., calcium was always above 10 mg. and phosphorus always above 5 mg. per hundred cubic centimeters. Each infant in groups 1 and 2 grew both in length and in weight at greater than the average rate; dentition was early, most of the infants having cut two teeth by 6 months of age and six teeth by 9 months of age. No infant attained the age of 8 months without having cut at least two teeth. Carpal centers became visible to the x-rays more rapidly than

16. Jeans, P. C., and Stearns, Genevieve: Proc. Soc. Exper. Biol. & Med. **31**: 1159 (June) 1934. Stearns, Genevieve; Jeans, P. C., and Vandecar, V.: J. Pediat., to be published.

17. Osborne, T. B., and Mendell, L. B.: J. Biol. Chem. **34**: 131 (April) 1918. Sherman, H. C., and Campbell, H. L., ibid. **60**: 5 (May) 1924. Sherman, H. C., and MacLeod, Florence L., ibid. **64**: 429 (June) 1925. Sherman, H. C., and Campbell, H. L.: J. Nutrition **2**: 415 (March) 1930; **10**: 363 (Oct.) 1935. Sherman, H. C., and Booher, Li. E.: J. Biol. Chem. **93**: 93 (Sept.) 1921. Campbell, H. L.; Bessey, O. A., and Sherman, H. C., ibid. **110**: 703 (Aug.) 1935.

18. Daniels, Amy L.; Hutton, Mary K.; Stearns, Genevieve, and Hejinian, Lucea M.: The Relation of Rate of Growth in Infants to Diet, Am. J. Dis. Child. **37**: 1177 (June) 1929.

19. Eliot, Martha M.: The Control of Rickets, J. A. M. A. **85**: 656 (Aug. 29) 1925. Hess, Lewis, MacLeod and Thomas.[39] Eliot and Jackson.[20] Kramer and Gittleman.[38] Wilson.[40]

20. Eliot, Martha M., and Jackson, Edith B.: Bone Development of Infants and Young Children in Puerto Rico, Am. J. Dis. Child. **46**: 1237 (Dec.) 1933.

21. Personal experience of the reviewer.

is usual. The infants were physically very active. The majority were able to sit unsupported by 6 months of age and could pull themselves to standing by 9 months. In short, the infants of these two groups were superb physical specimens. The retentions of calcium, phosphorus and nitrogen were very high, indicating that, notwithstanding the rapid growth, the mineralization of bones and the muscular development were above the average.

The rate of growth of the infants of group 3 was much slower than that of the babies in the other two groups, although it could be considered "average." Dentition was late; most of the infants did not begin cutting teeth until 8 or more months of age. None of these infants were able to sit unsupported at 9 months of age; two were able to do so by 10 months, but the muscles were flaccid and the posture poor. The retention of calcium and phosphorus by the babies of this third group was much less than in the babies of groups 1 and 2; so much less that the slower rate of growth did not compensate, and the retention per kilogram of weight increase and per centimeter of growth in length was definitely lower than the retention for the babies of groups 1 and 2.

The investigators who examined the roentgenograms of the wrists of the babies of these three groups included two who are expert in reading roentgenograms of infants, two heads of roentgenology departments in medical schools and an orthopedic surgeon experienced in reading roentgenograms of bone. All observers agreed that no infant in group 3 showed any evidence of rickets. One of the two experts and the orthopedic surgeon found no evidence of rickets in any of the roentgenograms in either group 1 or group 2. The

TABLE 1.—*Data Pertaining to J. A. (Group 2), Born Feb. 16, 1930*

Date, 1930	Rickets	Daily Calcium Retention, Gm.	Weight, Gm.	Serum Ca	Serum P
5/13	.....	0.380	5,965		
5/19	Doubtful				
5/27	.....	0.300	6,360		
6/ 6	Slight, under control				
6/10	.....	.....	.....	12	7.3
6/17	.....	0.328	6,980		
7/ 5	Slight, under control				
7/ 7	.....	.....	.....	11.5	6.7

Average blood values of group 3, calcium 11.6, phosphorus 5.8

	Gm.
Average daily calcium retention J. A. from 10th to 20th week	0.336
Average daily calcium retention group 3 for same period	0.235
Total calcium retention J. A. during 35 days, which include the period of rickets	11.76
Average total calcium retention group 3 for same period	8.2
Retention of calcium per kilogram of growth J. A. same per. (weight increase 1.016 Kg.)	11.44
Average retention per kilogram growth group 3 (weight increase 0.83 Kg.)	9.6
Retention of calcium per centimeter growth J. A. same per. (increase from 62 to 65 cm.)	3.87
Average retention per centimeter growth group 3 (average increase 2.55 cm.)	3.22

other observers each found evidence of slight rickets in both groups 1 and 2. In fact, each infant in these two groups was diagnosed as rachitic at some time during the period of infancy by at least one person. Rarely did two people agree as to the period of rickets. In view of the chemical data and growth and achievement records of these three groups of babies, it is surprising to find the interpretation of rickets in the babies of groups 1 and 2 and of no rickets in those of group 3. For the purpose of illustration, chemical data obtained from two infants of groups 1 and 2 are presented here, together with average data obtained from the studies of the babies of group 3. The infants cited were each typical of the infants of their groups; they are chosen because of the definite diagnosis of rickets made by an expert observer. For the sake of brevity only calcium retentions are stated; phosphorus retentions corresponded to the expected values as calculated from the calcium and nitrogen retentions.

J. A. (table 1) grew faster both in length and in weight than did the babies of group 3. During a thirty-

TABLE 2.—*Data Pertaining to C. T. (Group 1), Born Dec. 3, 1928* *

Date, 1929	Rickets	Daily Calcium Retention	Weight, Gm.
3/ 3	.....	0.309	6,120
3/14	Doubtful		
3/18	.....	0.333	6,670
3/31	.....	0.327	6,400
4/20	Doubtful, slight spreading		
5/18	Slight, under control		
6/ 1	.....	0.509	7,400
6/15	Slight, under control		
6/16	.....	0.655	7,690
6/30	.....	0.558	7,900
7/ 6	Slight (?), under control		
7/20	.....	0.495	8,400

* In the period from 3/3/29 to 7/20/29 C. T. grew 10.2 cm. in length and gained 2.28 Kg. The retentions were consistently higher than those of the babies of group 3.

five day period, which includes the time of the diagnosis of rickets, he retained more total calcium per kilogram and per centimeter of growth than did the babies of group 3 considered in the same age period. His serum calcium and phosphorus values were slightly higher than those of group 3. He received more vitamin D in his food and in addition received an abundance of sunlight during the time that "rickets" developed. He had cut three teeth at 22 weeks and sat alone at 25 weeks of age. Despite all these indications of good growth he had what was termed rickets, whereas the babies of group 3 with poorer retention for each unit of growth and poorer physical development had no rickets.

In the roentgenograms of those diagnosed as having slight rickets, something definite is present which differs from the appearance of roentgenograms usually classed as normal. Various observers interpret these changes differently and thus may be explained the differences in reported readings. The changes in the roentgenograms, though slight, are readily demonstrable and are identified repeatedly and without confusion by the same observer in a long series of examinations. These changes appear in the roentgenograms of babies receiving little or no vitamin D, tend to be absent in those of babies receiving moderate amounts of vitamin D, and appear in those of babies receiving an abundance of vitamin D. In the babies receiving little or no vitamin D and who are developing rickets as shown by later observation, the changes are the precursors of those which characterize unmistakable rickets. When they appear in babies who are receiving an abundance of vitamin D and who have high retentions of calcium and phosphorus, they obviously cannot represent the early stages of rickets but may be merely concomitants of rapid normal growth.

On the basis of these premises the diagnosis of slight rickets has been disregarded in the interpretation of the studies of this review. If the premises are unacceptable, the diagnosis of slight rickets must be disregarded in order to bring the various reported studies onto a more common ground for comparison.

(To be continued)

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SATURDAY, JUNE 13, 1936

THE FREQUENCY OF SMALLPOX AND SMALLPOX VACCINATION

Reasonably accurate data are now available from which it is possible to make a rough estimate of the extent of vaccination in the United States. A nation-wide survey,[1] which included 9,000 families in 130 localities in eighteen states, was made over a twelve months period. Thirty-nine thousand persons in every size of community were represented in the group. While it is natural that the statistics resulting from this study cannot be projected to the whole population, a definite effort was made to have the group entirely representative in all factors. The proportion of persons of different ages who gave a history of vaccination within seven years of the date of interview varied, according to Collins, from a maximum of 60 per cent at 10 years of age to 23 per cent at 20 to 24 years and 16 per cent at 25 to 34 years. The decline occurred at a less rapid rate thereafter. It was thus indicated that only perhaps 10 per cent of the people were revaccinated at intervals of seven years or less and that the great majority of children vaccinated at the time of entrance into school were never revaccinated. When all ages were considered, 56.9 per cent of the males and 57.9 per cent of the females gave a history of vaccination or of having had smallpox at some time in their lives. Three and 3.2 per cent respectively gave a history of a previous attack of the disease. In the rural areas included in the survey slightly more than 40 per cent of the adults gave a history of vaccination. In the cities with populations of 100,000 or more about 85 per cent of the adults had been vaccinated. Smaller cities and towns fell in between these two groups. The expected corollary with regard to the number of cases of smallpox was observed. Thus, 1.5 per cent of persons of all ages living in cities of more than a hundred thousand had a history of having had smallpox. In the towns under 5,000 and in rural areas there was a history of smallpox in 4.3 per cent. There is hence not so great a difference as might be expected from the vaccination statistics, the explanation for which might be the relatively less frequent contact and possibly the greater frequency of cowpox in the farm population.

The eighteen states in which the surveyed population lived was divided into four geographic sections: the Northeast, the North Central, the South and the West. The Northeast appeared to be less well vaccinated than the other sections, but this conclusion is not necessarily statistically representative, since in some geographic sections many cities were included in the surveyed sample and in others the sample was more largely rural.

The record of all medical care, whether for illness or for preventive service, affords accurate data on the frequency of vaccinations during the twelve months of the morbidity study. The record for one year, however, although more accurate than the historical material, might indicate more frequent or less frequent vaccinations than the average over a period of years. Those vaccinations which were performed during this period were largely concentrated in a few communities. Twelve communities, or 10 per cent of the 119 localities, including 9 per cent of the surveyed families, contributed 74 per cent of vaccinations during the year. The other 26 per cent of vaccinations were done in fifty-five communities. Forty-four per cent of the communities, including 30 per cent of the families, contributed no vaccinations during the studied year. The twelve localities that contributed nearly three fourths of the vaccinations were all classed as having epidemics or threatened epidemics during the observation year. Thus, in the nine communities with the largest numbers of vaccinations in which smallpox was epidemic in the county, the vaccinations were highly concentrated in the same months in which the largest numbers of smallpox cases were reported. It is clearly indicated, therefore, that the presence of smallpox supplies a powerful motive for vaccination.

The vaccinal status of families attacked by smallpox was especially interesting. Of the sixty-seven persons in the fourteen households attacked during the twelve months study, forty-eight, or 72 per cent, had never been vaccinated or had previous smallpox. This compares with 43 per cent unvaccinated in the whole surveyed group. Twelve persons, or 18 per cent, had been vaccinated at some time; in ten of the twelve the vaccination was more than seven years previous to the study. Ten per cent had suffered attacks of smallpox prior to the study, but five of the seven cases of this group were in one family. Of the thirty-one children under 15 years of age in attacked households, none had been vaccinated. This compares with 41 per cent vaccinated in the whole surveyed group. The data suggest that the households which were attacked by smallpox during the study period had less vaccinal protection and more previous smallpox than the average for the whole surveyed group. There were seventeen cases of smallpox in the whole surveyed population, which is at an annual case rate of 44.1 per hundred

1. Collins, S. D.: History and Frequency of Smallpox Vaccination and Cases in 9,000 Families, Pub. Health Rep. **51**: 443 (April 17) 1936.

thousand persons, as compared with a reported average annual rate for the United States of 37.1 for the years 1929 to 1930, a period approximating that covered by the survey. Sixteen of the seventeen cases occurred in persons with no history of vaccination or previous attack. This is a rate of 96 per hundred thousand of population, as compared with a rate of 5 per hundred thousand among persons previously vaccinated or immunized by attack. Since there were no smallpox deaths among these seventeen cases, the mortality data for the general population were used. In the continental United States there were 91,189 cases of smallpox reported in 1929 and 1930, an annual incidence rate of 37.1 per hundred thousand. The total of 347 deaths registered gives an annual mortality of 1.41 per million and a case fatality of 0.38 per cent. Evidently smallpox was not extremely malignant during these years.

The survey reported by Collins is especially significant in its indication that even now a relatively large proportion of the population is unvaccinated and that a further large number have had an insufficient number of revaccinations. The apparent present mildness of smallpox does not insure the permanent disappearance of the malignant variety, especially if any further increase in the nonimmune population occurs. Furthermore, an annual incidence rate of smallpox of 37.1 per hundred thousand, even when accompanied by a low mortality is, in view of the effectiveness of immunizing measures, a sufficient indication for unceasing vigilance and activity.

SUNLIGHT AND HEALTH

The belief that sunlight exerts a beneficial effect on health is at present exceedingly popular. Its general endorsement by the public is visible during the summer months at the beaches and summer resorts. The growing tendency to continue "sun bathing" throughout the year is indicated by the increasing numbers of "sun lamps" available on the open market and the rather large numbers of these devices purchased by the American people for use in their homes. But what is the scientific knowledge regarding the effects of sunlight and of ultraviolet rays on health? Does such information indicate a need for excessive basking in the sun's rays or does it suggest that this practice is unnecessary or perhaps even undesirable? Laurens[1] has recently reviewed the available knowledge in this field.

First, which of the sun's rays actually pass through the outer layer of the skin into the deeper strata? Studies have shown that practically all the rays in the extreme ultraviolet range are reflected from or absorbed by the outer, horny layer of the skin, whereas a considerable proportion of the longer ultraviolet, the visible and the near infra-red rays are transmitted and penetrate into the malpighian layer, the corium and, in the case of the visible and near infra-red rays, even the subcutaneous tissues. Thus, the horny layer of the skin apparently protects the deeper strata from the shorter ultraviolet rays. Pigment, which is present in the basal layer of cells of the stratum corium, apparently serves as a screen to prevent the "true skin" from receiving too much energy in the form of the longer ultraviolet rays.

The question of the effects of the rays that are transmitted by the stratum corneum into the deeper layers of the skin has received wide attention. Certain beneficial effects are well known, as, for example, the favorable influence of the ultraviolet rays on the assimilation of calcium and phosphorus and the resultant prevention or cure of rickets as the result of the formation of vitamin D in the skin. Favorable effects of moderate amounts of sunlight on the blood and circulation have also been described, particularly in increasing the platelet count in cases of idiopathic purpura haemorrhagica and as an adjuvant to diet and standard therapy in the treatment of secondary anemia. "Sunshine" carbon arc radiation has been alleged to cause a temporary decrease in both the systolic and the diastolic blood pressure in patients with essential hypertension. Natural sunlight, according to a number of authorities, hastens the healing of sluggish, indolent wounds by its local effect on the circulation of the blood and may be of benefit in tuberculosis of the skin (lupus vulgaris). Many believe that heliotherapy constitutes a valuable aid in the treatment of pulmonary tuberculosis. However, perhaps as many equally competent authorities feel that the results are "not likely to be spectacular and its omission not detrimental to the patient's best interest."

Harmful as well as beneficial effects may result from exposure to sunlight. Under certain conditions, as yet none too well defined, photosensitization may occur and the subject so sensitized may experience serious reactions on subsequent exposures to sunlight. A number of skin diseases, such as urticaria solaris and lupus erythematodes discoides, are probably due to this type of sensitization. Likewise it is well known that prolonged exposure to sunlight may cause not only inflammatory and degenerative changes in the skin but also systemic disturbances. One authority has stated that overexposure to sunlight may bring about damage to the central nervous system, especially the brain, as a result of heating of the skull.

Thus it is evident not only that sunlight may exert a beneficial influence on health but also that it may cause serious harmful effects. Laurens believes that the beneficial effects appear to be largely overemphasized. As far as is known, man actually requires only a relatively small amount of sunshine for the maintenance of normal health, and the greatest danger perhaps at the present time lies in too much exposure to sunlight rather than too little. Certainly, overindulgence in solar radiation should be avoided because of known possible

1. Laurens, Henry: Sunlight and Health, Scient. Monthly **42**: 312 (April) 1936.

ill effects. "Owing to the hypersensitivity of many infants and adults, caution should be used in the use of sunlight, both natural and artificial. Overindulgence, even in the normal, is foolhardy."

THE DANGERS OF VENTRICULOGRAPHY

Ventriculography is defined by Pendergrass [1] as a procedure in which a series of roentgenograms is made of the head in several positions in the horizontal posture within one hour following the removal of all the available cerebrospinal fluid from the ventricles of the brain and its replacement by air. Since the procedure was first described by Dandy in 1918 a voluminous literature has developed, the general trend of which has been to stress the diagnostic value of ventriculography and to minimize the dangers. Several writers have pointed out complications that may follow ventriculography. At the Neurological Institute of New York a study of the dangers and mortality of ventriculography was made covering the five year period that ended with 1932. Riggs [2] says in the report of this study that ventriculography was performed 148 times for suspected brain tumors. During the first two years the posterior horn of one ventricle was punctured, the fluid was withdrawn, and then air was injected. Later Frazier's method was followed, whereby bilateral trephine openings were made, a needle was introduced into each posterior horn and air allowed to enter the ventricles as the fluid was evacuated by turning the head in various directions. During the last two years of the five year period changes were made in the site of the trephine openings, according to the technic described by Deery.

The most common mild symptoms that followed ventriculography in the 148 cases were headache, nausea, vomiting, and some rise in temperature. The dangerous symptoms that frequently followed consisted of stupor in forty-three cases, and changes in respiration, pulse, blood pressure and temperature; twelve of these patients died. In the fatal cases there was usually a progressive stupor, with a terminal rise in temperature to about 107 F. Three patients died of acute respiratory failure, one being kept alive for several hours by artificial respiration. The onset of the stupor varied from immediately after the ventriculography to the third day. The dangerous symptoms that developed usually appeared within the first ten hours, but in the patients who succumbed following ventriculography the dangerous symptoms began within the first eight hours in most of the cases. The forty-three patients who developed dangerous symptoms, including the twelve who died, comprise two groups: (*a*) those who were acutely ill with advanced signs of brain tumor and were stuporous before the introduction of air and (*b*) those who were not stuporous and were generally in fair condition before ventriculography was performed. Of the twelve patients who died, eight belonged to the second group; of the thirty-one patients who had dangerous symptoms but recovered, twenty-three belonged to the second group.

Fatalities following ventriculography, the New York investigators concluded, are usually due to the profound effects on the pressure conditions within the cranial cavity of the removal of fluid and the introduction of air and are rarely due to hemorrhage into the ventricles. There is a delicate balance, they say, in most instances, and particularly in subcortical growths, in the pressure conditions within the cranial chamber, which is profoundly disturbed when fluid is removed and air allowed to enter the ventricles. Ventriculography is especially dangerous in patients having subcortical tumors located deep enough to make pressure on the third ventricle and the brain stem. Furthermore, the relations of the various parts of the brain to one another are probably altered during the evacuation of fluid and the entrance of air into the ventricles. The report of this investigation seems to show that death or dangerous symptoms occurred less often when one trephine opening was made and when fluid was removed gradually and air injected slowly.

In the treatment of the forty-three patients who developed dangerous symptoms after ventriculography, the use of caffeine and hypertonic dextrose solution intravenously was rarely of any benefit; among those who died, puncture of the ventricle to evacuate the air had practically no beneficial effect. However, in 78 per cent of the patients who had dangerous symptoms but recovered there was a definite beneficial effect from the release of the air in the ventricles. The major operation for the brain tumor probably should follow the ventriculography just as soon as the x-ray films have been developed and a decision has been made as to the location of the tumor. This rule has been adopted in many neurologic clinics.

Masson [3] reported another study from the Neurological Institute of New York concerning the disturbances in vision after ventriculography. Six cases of temporary blindness occurred among 100 consecutive cases. One of these patients had reduction in visual acuity before the ventriculography, but the other five patients had either normal or slightly reduced visual acuity before the ventriculography. The vision of all these six patients, however, was regained in from twenty-one to seventy-two hours. Four of them were operated on during the blind period and the loss of sight in them averaged forty-five hours; in two patients who were not operated on during the blind period, the blindness lasted twenty-one and twenty-six hours. Masson and his associates offer no satisfactory expla-

1. Pendergrass, Eugene: Indications and Contraindications of Encephalography and Ventriculography, J. A. M. A. **96**: 408 (Feb. 7) 1931.

2. Riggs, H. W.: The Dangers and the Mortality of Ventriculography, Bull. Neurol. Inst. New York **3**: 210 (June) 1933.

3. Masson, C. B.: The Disturbances in Vision and in Visual Fields After Ventriculography, Bull. Neurol. Inst. New York **3**: 190 (June) 1933.

nation for the temporary blindness, but believe it was in some way connected with the puncture of the brain.

Since practically all patients with brain tumors die unless operated on, and since location of the tumor is essential to proper operative procedures, ventriculography is in some cases an indispensable diagnostic procedure. It should be used, however, only in patients in whom localization of the tumors is impossible by clinical means, and special care should be taken in patients whose tumor is causing pressure on the third ventricle or the brain stem.

Current Comment

OXYGEN AND SEIZURES OF EPILEPSY

In the majority of patients having frequent attacks of petit mal, seizures can be consistently induced by anoxemia. Analyses of the respired air of epileptic patients during an attack have shown that the oxygen content is decreased from the normal of approximately 14 per cent to from 8 to 12 per cent. Unconsciousness occurs in normal persons when the oxygen content is reduced to about 7 per cent. As a low oxygen tension precipitates seizures in epileptic patients, a high oxygen tension might prevent or at least lessen the frequency of attacks. This possible effect of oxygen has been recently subjected to experimental study.[1] The patients used for the investigation were three young women who were having numerous attacks of petit mal daily and with whom experience over a period of years had demonstrated that seizures invariably followed either the breathing of an oxygen-poor mixture or hyperpnea. The patients, along with the observers, were placed in a gas-tight chamber and were subjected to pressures ranging up to 4 atmospheres for periods of from three and one-half to five hours. The number of attacks of petit mal which occurred during these periods were compared with those during an equal interval on the same day while the patients were exposed to normal atmospheric pressure. The data thus obtained showed that the number of spontaneous attacks was decreased an average of 45 per cent during the periods of increased pressure. Similar results were obtained in studies on the effect of increased oxygen tension on seizures induced by hyperpnea. As the pressure of oxygen was increased in the inspired gas mixture, the time required for the precipitation of a seizure was correspondingly increased. In one patient a twenty-fold increase in oxygen tension resulted in a fivefold increase in the amount of overventilation required to produce an attack. These observations seem to indicate a distinct relation between the oxygen content of respired air and seizures of petit mal. The exact nature of this relation is as yet not known but it is possible that some alteration of the acid-base balance of the blood is involved. It is well known that patients remain seizure free while in a state of acidosis and perhaps the administration of oxygen under the conditions employed may have favored the development of a similar condition.

1. Lennox, W. G., and Behnke, A. R.: Effect of Increased Oxygen Pressure on the Seizures of Epilepsy, Arch. Neurol. & Psychiat. **35**: 782 (April) 1936.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

Noise Abatement Committee.—Mayor Rossi has appointed a committee of physicians, engineers, lawyers, civic organization officials and other lay persons to study noise abatement in San Francisco. The department of health of San Francisco, working through its division of industrial hygiene, has made certain recommendations to the newly appointed committee, following a two weeks intensive survey with special noise detecting instruments.

Low Infant Mortality Rate.—California recorded the lowest infant mortality rate on record in 1935, 49.5 per thousand live births. Of 3,973 infant deaths recorded, 2,546 were among white infants, giving a white infant mortality rate of 39.5. On the other hand, there were 1,184 deaths of Mexican infants recorded, giving a racial infant death rate of 100.7. Ten per cent of Mexican infants born in California last year died during the first year of life, while less than 4 per cent of white infants died during the first year of their existence, according to the state health department.

State Medical Election.—Dr. Howard Morrow, San Francisco, was chosen president-elect of the California Medical Association at the recent meeting in Coronado, and Dr. Edward M. Pallette, Los Angeles, was installed as president. The next annual session of the association will be held in Del Monte. A resolution was passed opposing the opening of county hospitals to nonindigent persons. It is expected that an initiative measure authorizing this extension of hospital service will appear on the ballot in the November election. The association also took the position that roentgen technic, including laboratory services, constitute medical service and therefore should be under the control of the medical profession.

Public Health in University Program.—At the Institute of Government, June 15-19, sponsored by the University of California at Los Angeles, the program for the public health section, under the direction of Ira V. Hiscock, C.P.H., professor of public health, Yale University School of Medicine, New Haven, will include the following speakers:

Dr. Hiscock, Trends in Public Health and Methods of Measuring Needs and Effectiveness of Public Health Service.
Dr. Fred T. Foard, San Francisco, regional consultant, U. S. Public Health Service, The Social Security Act and Public Health.
Dr. Edith P. Sappington, San Francisco, regional consultant, Children's Bureau, The Social Security Act and Maternity and Child Hygiene.
C. V. Duckworth, assistant director, state department of agriculture, Bovine Tuberculosis and Undulant Fever.
Dr. Jacob C. Geiger, health officer of San Francisco, Milk Inspection.

CONNECTICUT

State Medical Meeting and Election.—Dr. Daniel C. Patterson, Bridgeport, was elected president of the Connecticut State Medical Society at its annual meeting in Hartford, May 20-21. Vice presidents are Drs. Thacher W. Worthen, Hartford, and Hugh B. Campbell, Uncas-on-Thames, Norwich, and the treasurer is Dr. James R. Miller, Hartford. It was agreed to establish a full time office for the society in New Haven, to be under the direction of Dr. Creighton Barker as administrative secretary. Dr. Charles W. Comfort Jr., New Haven, under the new arrangement becomes legislative secretary, and Dr. Stanley B. Weld, Hartford, secretary on scientific work. Dr. Weld will also be editor of the quarterly bulletin now planned by the society. The address of the new office is 258 Church Street, New Haven, and Miss Margaret Capello is the secretary. Out of state speakers on the program included:

Dr. Adrian S. Taylor, Clifton Springs, Clinical Aspects of Thyroid Disease.
Dr. Stafford L. Warren, Rochester, N. Y., Results of Comparative Doses on Human Tumors Using Fever and Roentgen Radiation.
Dr. Emil Novak, Baltimore, Use and Abuse of Endocrinology in Gynecology.
Dr. Arthur P. Noyes, Howard, R. I., Relationship of Psychiatry to Medicine.
Dr. George C. Andrews, New York, Pustular Bacterids of the Hands and Feet.
Dr. Conrad Berens, New York, Clinical Considerations of Ocular Fatigue.
Dr. Ebenezer Ross Faulkner, New York, Review of Operative Technic in Nose and Throat Surgery.

DELAWARE

Medical Art Exhibit.—The Delaware Academy of Medicine participated in the second annual Delaware Art Week, May 3-10, in Wilmington, by displaying in the library an exhibit showing "Art as Applied to Medicine."

Health at Wilmington.—Telegraphic reports to the U. S. Department of Commerce from eighty-six cities with a total population of 37 million, for the week ended May 30, indicate that the highest mortality rate (17.7) was for Wilmington. For the group of cities as a whole it was 10.9. The mortality rate for Wilmington for the corresponding period last year was 10.8 and for the group of cities, 11.5. The annual rate for eighty-six cities for the twenty-two weeks of 1936 was 13.3 as against a rate of 12.4 for the corresponding period of the previous year. Caution should be used in the interpretation of these weekly figures, as they fluctuate widely. The fact that some cities are hospital centers for large areas outside the city limits or that they have a large Negro population may tend to increase the death rate.

DISTRICT OF COLUMBIA

Medical Bills in Congress.—S. 4195 has passed the Senate, directing the Commission on Licensure to Practice the Healing Art to issue a license to Dr. Ralph Charles Stuart. A similar House bill, H. R. 11695, has been favorably reported to the House.

Society News.—The Washington Ophthalmological Society was addressed, May 4, among other speakers, by Deane B. Judd, Ph.D., of the National Bureau of Standards on "Color Blindness and Anomalies of Vision" and Major Raymond O. Dart of the Army Medical Museum on "Ocular Tumors."

FLORIDA

Society News.—Dr. Kenneth A. Morris, Jacksonville, addressed the Duval County Medical Society, May 5, on "Surgery in the Treatment of Pulmonary Tuberculosis."——At a meeting of the Lake County Medical Society, April 3, Dr. Spencer A. Folsom, Orlando, discussed hyperinsulinism.——The Pinellas County Medical Society was addressed in St. Petersburg, May 1, by Dr. George E. Miller, on influenza. Dr. Orville N. Nelson, Bay Pines, discussed head injuries before the society, May 15.

GEORGIA

Personal.—Dr. William D. Jennings Jr., Augusta, has been appointed to the newly created position of police and fire surgeon.

Society News.—The Fulton County Medical Society was addressed in Atlanta, June 4, by Drs. Allen H. Bunce on "Diagnosis and Medical Treatment of Gallbladder Disease"; John Shelton Horsley, Richmond, Va., "Surgical Aspect of Cancer," and Roy R. Kracke, Emory University, "Leukopenic Diseases." Dr. Horsley also addressed the second anniversary meeting of the Atlanta Cancer Clinic at the Georgia Baptist Hospital, June 4-5.——At a meeting of the Second District Medical Society in Quitman, April 10, speakers included Drs. John C. Keaton, Albany, on "Transurethral Prostatic Resection"; William G. Hamm, Atlanta, "Harelips and Cleft Palates," and Henry M. Moore, Thomasville, "Tobacco Amblyopia."——The Colquitt County Medical Society was addressed in Moultrie, April 7, by Dr. James A. Redfern, Albany, on "Electrocardiograph and Its Use in the Diagnosis of Various Heart Conditions," and Dr. Thomas H. Chesnutt, Moultrie, diphtheria.——A symposium on infections of the genito-urinary tract was presented before the Coffee County Medical Society in Douglas, April 28, by Drs. Bascom O. Quillian and Thomas H. Clark, both of Douglas.——Dr. Job C. Patterson read a paper before the Randolph County Medical Society in Cuthbert, May 7, on "Abdominal Pain—Differential Diagnosis."——Among others, Dr. Everett L. Bishop, Atlanta, addressed the Macon Medical Society of Bibb County, April 7, on "Bone Tumors and Their Treatment by Radiation or Surgery." Dr. Robert C. Goolsby Jr., Macon, addressed the society, May 7, in Macon, on "Care of the Sick and Injured in Storm Devastated Areas."

IDAHO

Annual Registration Due July 1.—All practitioners of medicine and surgery holding licenses to practice in Idaho are required by law to register annually on July 1, with the department of law enforcement, and at that time to pay a fee of $2. If a licentiate has not paid the annual registration fee by October 1, his license can be canceled but will be restored within five years thereafter on payment of the delinquent fees and a $10 penalty. If a license has been canceled for more than five years, it can be reinstated only on the payment of $25 and on the licentiate's passing an examination, the nature of which shall be determined by the department of law enforcement.

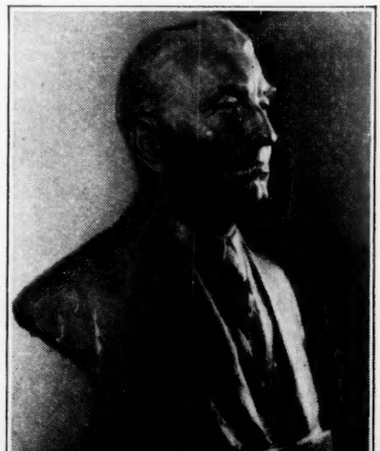
ILLINOIS

State Medical Election.—Dr. Rollo K. Packard, Chicago, was named president-elect of the Illinois State Medical Society at its recent annual meeting in Springfield, and Dr. Rolland L. Green, Peoria, was installed as president. Vice presidents are Drs. Richard F. Herndon, Springfield, and John W. Long, Robinson; Drs. A. J. Markley, Belvidere, and Harold M. Camp, Monmouth, are treasurer and secretary respectively. The next annual session will be held in Peoria.

Chicago

Personal.—Dr. Walter Wile Hamburger has resigned as clinical professor of medicine at Rush Medical College, University of Chicago, effective July 1.——Dr. G. Howard Gowen has been appointed assistant epidemiologist to the state department of health, effective July 1.

Bust of Dr. Carlson Unveiled.—A bust of Dr. Anton J. Carlson, professor and chairman of the department of physiology, University of Chicago, was unveiled, June 1, in the hall of the physiology building, the gift of friends and students of Dr. Carlson. The bust was presented to the university by Dr. Arno B. Luckhardt, also professor of physiology at the school, and Frederic C. Woodward, LL.D., vice president, gave the speech of acceptance. Dr. Carlson was born in Sweden in 1875. He came to America in 1891, taking his degree of doctor of philosophy at Leland Stanford University in California, in 1902. After two years of teaching and research at Stanford and Carnegie Institution he joined the University of Chicago in 1904 as assistant professor of physiology and in 1914 was made professor. In 1929 he received the title of Frank P. Hixon distinguished service professor. Dr. Carlson's research has included among others the following subjects: rate of conduction of the impulse in nerves; the nature of the heartbeat; lymph formation and salivary secretion; comparative physiology of the circulation; comparative physiology of the thyroid and parathyroid; physiology of the alimentary tract and of the visceral sensory nervous system.



INDIANA

Child Health.—A new program of child health is to be instituted in public schools of the state as a part of Indiana's activities in connection with the federal government's social security plan. Dr. Thurman B. Rice, assistant director of the state health department, will be in charge of the program, with the title of director of physical and health education.

Changes in Health Officers.—The monthly bulletin of the Indiana Division of Public Health announces the following changes in health officers:

Dr. Elmer D. Johns, Zionsville, succeeding Dr. Lawrence S. Bailey as town health officer.

Dr. Camden G. Bothwell, Martinsville, succeeding Dr. George B. Breedlove as health officer of Morgan County.

Dr. James L. Denaut, health officer of Hamlet.

Dr. Clyde J. Munns, Newburgh, succeeding Dr. John T. Samples as health officer of Warrick County.

Physicians Honored.—Drs. William N. Wishard, professor and head of the department of genito-urinary surgery, and Charles E. Ferguson, emeritus professor of obstetrics, Indiana University School of Medicine, Indianapolis, were guests of honor at a banquet, April 29, given by the Pi chapter of Phi Rho Sigma Fraternity. They are the oldest alumni of the local

chapter of the fraternity, Dr. Wishard having graduated from Indiana Medical College in 1874 and Dr. Ferguson in 1892. Dr. Wishard, 84 years old, is still in active practice and Dr. Ferguson, now 79, retired from teaching in 1920. Dr. Roscoe L. Sensenich, South Bend, president of the state medical association, gave an address at the banquet, and Dr. Ezra Vernon Hahn, Indianapolis, was toastmaster.

Resolution on Change in Control of Veterans' Medical Service.—Members of the Wade H. Williamson Post, number 241, American Legion, Patriot, recently adopted a resolution urging that the present system of handling veterans' affairs through the Veterans' Administration be replaced by a pension system with local examining boards as the basic unit. The resolution recommends that all money expended by the federal government for hospitals or for hospitalization be given for the maintenance and support of local hospitals or paid in cash for the disabled veteran, and that he be allowed his constitutional right to select the hospital and physician of his own choice and pay his own bill. The resolution, submitted by Dr. Miles F. Daubenheyer, suggests that these examining boards be composed of three physicians with one lay member to determine the nature and degree of disability of veterans.

IOWA

Tribute to Physicians.—Drs. William Jepson and Frank J. Murphy, Sioux City, were guests of honor at a dinner meeting of the Woodbury County Medical Society, May 26. Dr. Jepson, who has completed fifty years in the practice of medicine, was presented with a watch. Dr. Murphy is now in his fiftieth year of practice. Dr. Charles T. Maxwell, Sioux City, president of the county medical society, presided, and speakers included the following physicians: Kellogg Speed, Chicago, who discussed fractures of the spine, and William R. Whiteis, Iowa City; Peter H. Salter, Norfolk, Neb.; Joseph C. Ohlmacher, Vermillion, S. D.; Edward M. Myers, Boone; Howard L. Beye, Iowa City; Ewen M. MacEwen, Iowa City; Walter L. Bierring, Des Moines, and Prince E. Sawyer, Sioux City.

Society News.—The Des Moines Academy of Medicine and Polk County Medical Society were addressed, May 26, by Drs. Arthur W. Erskine, Cedar Rapids, on "Cancer Survey in Iowa"; Lester G. Ericksen, Dubuque, "Early Recognition of Carcinoma of the Stomach," and Alva P. Stoner, "Rôle of Fibrous Tissue in the Repair of Hernia, with Special Reference to Injection Therapy."——Dr. Alice M. Humphrey Hatch, Des Moines, was chosen president of the State Society of Iowa Medical Women at its annual meeting. Life memberships in the society were conferred on the following physicians: Sophie H. Scott, Nelle P. S. Noble, Jeannette Dean Throckmorton, Leone Morden Scruby, all of Des Moines; Eppie S. McCrea, Eddyville; Emma Jewel Neal, Cedar Rapids; Jane D. McIntosh Wright, Clear Lake; Rosabell A. Butterfield, Indianola; Mary K. Heard, St. Petersburg, Fla., and Pauline M. Leader, Clarinda.——Dr. Robert Q. Rowse, Sioux City, was elected president of the Iowa Clinical Surgical Society, April 25.

KANSAS

Fifty Years of Practice.—Drs. William E. Ham, Beattie, and Robert Hawkins, Marysville, were guests of honor at a dinner given by Dr. John W. Randell at his home in Marysville recently in recognition of their completion of fifty years in the practice of medicine. Dr. Hawkins was unable to be present on account of illness in his home. Speakers in a symposium on tuberculosis were Drs. Harold E. Petersen, Earl M. Shores and Jacob Kulowski, St. Joseph, Mo. Dr. Ham graduated from Rush Medical College in 1882 and Dr. Hawkins in 1885.

KENTUCKY

Personal.—Dr. Alfred F. Smith, Georgetown, has been appointed health officer of Greenup County, succeeding Dr. Carl M. Gambill, who held the position three years.——Dr. Anton J. Carlson, Chicago, delivered the annual Alpha Omega Alpha address to the University of Louisville School of Medicine, April 17, on "Observations on Science and Medicine in Russia and China."

Society News.—The committee on graduate courses in diseases of children of the Kentucky State Medical Association began a course at the Children's Free Hospital, Louisville, April 22, to continue each Wednesday for ten weeks. Interesting cases in the hospital are presented and newer methods of treatment discussed. Dr. Philip F. Barbour, Louisville, is in charge.——At the final meeting for the year of the Jefferson County Medical Society, Louisville, a discussion of the management of epidemics was presented by Drs. Fred W. Caudill, who spoke on epidemic meningitis; Ben W. Smock, typhoid, and Samuel J. Brownstein, diphtheria. At the meeting, June 1, speakers were Drs. Karl D. Winter, on "Cautery Pneumonectomy for Lung Abscess"; Rettig A. Griswold and Edward M. Drissen, "Stab Wounds of the Heart"; Armand E. Cohen and Maurice G. Buckles, "Modern Treatment of Bronchial Asthma."——Dr. Roy Glenwood Spurling, Louisville, addressed the Louisville Surgical Society, June 5, on "Spinal Cord Tumors."

MASSACHUSETTS

Personal.—Dr. John A. Foley has been named clinical professor of medicine at Boston University School of Medicine and Dr. William Reid Morrison, clinical professor of surgery.

Milk Company Indicted.—The *New England Journal of Medicine* reports that the chief officials of the Whiting Milk Companies have been indicted by a Suffolk grand jury for distributing in large quantities, as fresh cow's milk, a grossly adulterated substance. During the milk shortage of the March floods, according to the contention of the Boston Health Department, the Whiting Milk Companies conspired to manufacture a product from an inferior grade of Dutch skimmed milk powder and rancid South American butter; over 100,000 quarts was sold to chain stores in the poorer districts of Boston as pure milk. The journal points out that the Whiting Milk Companies were convicted in 1932 of adding a foreign substance to milk and paid a fine.

Dr. Russell Awarded Medal.—Dr. Frederick F. Russell, lecturer in preventive medicine and hygiene and epidemiology, Harvard Medical School, Boston, and formerly director of the International Health Division of the Rockefeller Foundation, has been awarded the Public Welfare Medal of the National Academy of Sciences. Dr. Russell retired Sept. 1, 1935, as director of the International Health Division. From 1920 to 1923 he was director of the public health laboratory service of the International Health Board. From 1923 until his resignation in 1935 he was general director of the board. The Public Welfare Medal is provided through the Marcellus Hartley Fund, a trust established in 1913-1914 through a gift from Mrs. Helen Hartley Jenkins in memory of her father, Marcellus Hartley.

MINNESOTA

Lectureship in Honor of Dr. Lyon.—The establishment of the Elias Potter Lyon Medical Lectureship at the University of Minnesota has been announced as a tribute to Dr. Lyon, dean of the medical school, who is retiring from active service at the close of the present academic year. The fund for this purpose is to be raised through subscriptions by alumni, faculty, students and friends. Contributions should be sent to Mr. William T. Middlebrook, comptroller, University of Minnesota, Minneapolis.

Society News.—At a meeting of the Minnesota Academy of Ophthalmology and Otolaryngology in Rochester, May 5, speakers were Drs. Henry L. Williams Jr. on "Analysis of Cases of Petrositis"; Gordon B. New, "Benign Tumors of the Larynx"; William L. Benedict, "Tumors of the Orbit"; Hugo L. Blair, "Physiologic Factors in Perimetry," and Philip S. Hench, "Fever Therapy." All are of Rochester.——Dr. Robert G. Green, Minneapolis, discussed "Epizootiology of Tularemia" before the Minnesota Academy of Medicine, May 13.

Personal.—Dr. William J. Mayo, Rochester, delivered the commencement address at Notre Dame University, South Bend, Ind., June 7; both William J. and Charles H. Mayo received honorary degrees on this occasion.——Dr. John A. Malmstrom has resigned as health officer of Virginia to return to private practice.——Dr. Pierre C. Pilon, Paynesville, was guest of honor at a dinner recently, given in recognition of his completion of fifty years in the practice of medicine.——Dr. Anthony J. Spang has been appointed medical superintendent of the St. Louis County Hospital at Buhl, succeeding Dr. Oliver E. Sarff.

MISSISSIPPI

List of Automobile Victims.—The state board of health has published a pamphlet dramatizing deaths from automobile accidents, attributing them not to "accidents" but to specific causes. The pamphlet points out that recklessness, carelessness, foolishness and drunkenness are the causes. In addition to statistics, it lists the names, classified according to counties, of persons who died in Mississippi in 1935 in automobile accidents or as the result of automobile accidents. Motor vehicle deaths in Mississippi have increased 83 per cent in the past four years.

NEBRASKA

Personal.—Dr. Clarence S. Moran has recently been promoted to be assistant professor of pathology at Creighton University School of Medicine, Omaha, and Dr. William Howard Schmitz, associate professor of urology.——Dr. Inez C. Philbrick, Lincoln, has resigned after many years as resident physician for women at the University of Nebraska.——Dr. Archibald R. McIntyre, professor of physiology and pharmacology at the University of Nebraska College of Medicine, Omaha, has been appointed chairman of the department.

NEW MEXICO

Bureau of Child Welfare.—In a news item published in THE JOURNAL, May 2, under the heading "Child Welfare Extended with Federal Funds," the state bureau of child welfare was mentioned as a division of the state department of public health. The bureau of child welfare and the bureau of public health are independent bureaus.

NEW YORK

Personal.—Dr. Lawrason Brown, Saranac Lake, received the honorary degree of doctor of science at the annual commencement of the Medical College of Virginia, Richmond, June 2.——Dr. Jacob E. K. Morris, Olean, was honored with a banquet given by his colleagues and other friends recently to celebrate his golden anniversary in the practice of medicine.

Annual Public Health Conference.—The annual conference of health officers and public health nurses will be held at the Grand Union Hotel at Saratoga Springs, June 23-25. Among physicians on the program are:

Dr. Floyd S. Winslow, Rochester, president of the Medical Society of the State of New York, Specialization in Public Health.
Dr. Rufus I. Cole, New York, Pneumonia Control.
Dr. Warren T. Vaughan, Richmond, Va., Hay Fever Pollen Reactions—To What Extent Are They Preventable?
Dr. Paul A. O'Leary, Rochester, Minn., What the Treatment of Syphilis Accomplishes.

One session will be devoted to a symposium on tuberculosis with the following speakers: Drs. Max Pinner, Oneonta; James Burns Amberson Jr., New York, and Ethan Flagg Butler, Ithaca, and Mrs. Violet Hodgson, R.N., supervisor of tuberculosis outpatient nursing, state department of health.

New York City

Society News.—The Public Health Association of New York City was organized May 18, made up of New York members of the American Public Health Association.——The Medical Society of the County of Queens held a joint meeting with the Queens County Bar Association, May 26, with the following speakers: Mr. Lloyd P. Stryker, formerly counsel to the Medical Society of the State of New York, on "The Doctor, the Law and the State"; Alexander O. Gettler, Ph.D., professor of toxicology, New York University College of Medicine, "The Rôle of Toxicology in the Medicolegal Autopsy"; Charles P. Sullivan, district attorney, Queens County, "Crime Among Juveniles," and Dr. Jacob Werne, assistant county medical examiner, "Autopsy Experiences in the Evaluation of Trauma."——Speakers at a meeting of the New York chapter of the Pan American Medical Association, May 27, were Drs. William Wayne Babcock, Philadelphia, on "Diagnosis and Treatment of Malignancy of the Intestinal Tract"; Frederick M. Allen, "Management of Diabetic Patients Requiring Abdominal Surgery," and William A. Kellogg, "Vesico-Intestinal Fistula."——Drs. Irving Sherwood Wright and Allen O. Whipple addressed the Medical Society of the County of Kings, May 19, on "Present Status of Peripheral Vascular Disease: Diagnosis and Treatment" and "Studies in the Combined Clinic on Splenic Disease" respectively.——Dr. John F. Erdmann addressed the New York Surgical Society, May 13, on "Tumors of the Uterus, with Special Reference to Fibroids."

NORTH CAROLINA

Society News.—Dr. James W. Tankersley, Greensboro, was elected president of the North Carolina Academy of Surgery at the annual meeting in Asheville recently.——At the quarterly meeting of the Fourth District Medical Society in Goldsboro, April 28, speakers were Drs. Paul V. Anderson, Richmond, Va., on "Facts and Fallacies Concerning Insanity"; Henry B. Ivey and Corbett E. Howard, Goldsboro, on "X-Ray Study of Breast Lesions," and Richard S. Anderson, Rocky Mount, "Carcinoma of the Jejunum."——Dr. Tibor de Cholnoky, New York, addressed the Buncombe County Medical Society, Asheville, April 20, on "Cancer and Electrosurgery."——Dr. Leroy J. Butler, Winston-Salem, was elected president of the North Carolina Pediatric Society at the annual meeting in Asheville, May 6.

NORTH DAKOTA

State Medical Election.—Dr. Edwin L. Goss, Carrington, was chosen president-elect of the North Dakota Medical Association at the annual meeting in Jamestown in May, and Dr. William A. Gerrish, Jamestown, was installed as president. Drs. William H. Long, Fargo, and Lee B. Greene, Edgeley, were elected vice presidents and Dr. Albert W. Skelsey, Fargo, was reelected secretary. The 1937 meeting will be held in Grand Forks.

OHIO

"Alumnal Day Clinics" at Cincinnati.—Alumni of the University of Cincinnati College of Medicine were guests of the college for a program of clinics at the Cincinnati General Hospital, June 4. In charge of the clinics were Drs. Mont R. Reid, Burr Noland Carter, Marion A. Blankenhorn, Julien E. Benjamin, Robert R. MacDonald and Glenn E. Cullen, Ph.D. The afternoon was devoted to visits to the university's research laboratories. The annual alumni banquet was held at the Netherland-Plaza Hotel.

Personal.—Dr. John L. Jones, Medina, health commissioner of Medina County, has been appointed special investigator in the bureau of child hygiene of the state department of health. He will make a detailed investigation of maternal deaths in cooperation with the Hospital Obstetric Society of Ohio, it is reported.——Dr. Tom Douglas Spies has been promoted from assistant to associate professor of medicine at the University of Cincinnati College of Medicine and Dr. Eugene B. Ferris Jr., from instructor to assistant professor of medicine.

Sectional Meeting.—The Northwestern Ohio Medical Association held its ninety-second annual meeting at Findlay, June 2. After a golf tournament at the Findlay Country Club, the following program was presented:

Dr. Thomas K. Brown, St. Louis, Puerperal Infections.
Dr. John T. Murphy, Toledo, Use of X-Rays in the Treatment of Cancer of the Breast.
Dr. John A. Toomey, Cleveland, A Critical Evaluation of Recent Advances in Contagious Diseases.
Dr. Fred W. Rankin, Lexington, Ky., Modern Treatment of Cancer of the Lower Gastro-Intestinal Tract.
Dr. Roy W. Scott, Cleveland, Diagnosis and Management of Patients with Cardiovascular Disease.
Dr. Stanley R. Woodruff, Jersey City, N. J., Modern Methods of Combating Urinary Infections.

Dr. Amos O. Squire, Ossining, N. Y., former chief physician at Sing Sing Prison, gave an address at the dinner in the evening at the Elks' Club.

PENNSYLVANIA

Personal.—Dr. Lewis C. Rowles, Clearfield, has been appointed medical director of Clearfield County to succeed Dr. Horatio L. Woodside, Bigler, who resigned in October 1935.——Dr. Albert M. Sittler, Bowmanstown, celebrated in April the fiftieth anniversary of his graduation from Jefferson Medical College, Philadelphia.——Dr. Arthur P. Noyes, Howard, R. I., has been appointed superintendent of the Norristown State Hospital, succeeding Dr. Annie R. Elliott.

Graduate Assembly in Harrisburg.—The Harrisburg Academy of Medicine presented its third graduate medical assembly at the Penn-Harris Hotel, May 7. Speakers were:

Dr. Thomas Fitz-Hugh Jr., Philadelphia, Management of Certain Blood System Diseases.
Dr. William F. Rienhoff Jr., Baltimore, Carcinoma of the Lung.
Dr. Samuel A. Levine, Boston, Bedside Recognition and Treatment of Cardiac Irregularities.
Dr. Joseph F. McCarthy, New York, Interrelation of Urology with General Medicine.
Dr. Alan G. Brown, Toronto, Common Errors in Diagnosis and Treatment in Diseases of Children.
Dr. Chevalier Jackson, Philadelphia, Diseases of the Larynx—Benign and Malignant.

Philadelphia

Meeting of Undergraduate Association.—The twenty-eighth annual meeting of the Undergraduate Medical Association of the University of Pennsylvania School of Medicine was held May 7. Fourteen students presented papers. Addresses were made by the following guests: Drs. George R. Minot, Boston, on "Anemia and Its Relation to the Gastro-Intestinal Tract"; Derek Denny-Brown, neurologist to St. Bartholomew's Hospital, London, "Innervation of the Bladder and Vesical Sphincters" and Carl F. Schmidt, "Intrinsic Control of Cerebral Circulation."

Dr. Burr Honored.—Friends of Dr. Charles W. Burr gave him a testimonial dinner, April 25, at the Union League on the occasion of the fiftieth anniversary of his graduation in medicine and his election to the presidency of the Medical Alumni Society of the University of Pennsylvania. Dr. Daniel J. McCarthy was toastmaster. Eight classmates of Dr. Burr attended the dinner, as follows: Drs. John F. Culp, Harrisburg; Elliston J. Morris, William E. Parke, Charles J. Homan, Otto A. Rath, Paul J. Sartain, William H. Teller and William Zentmayer, all of Philadelphia.

Antinoise Ordinance Adopted. — The city council of Philadelphia has adopted a noise abatement ordinance prepared by a special committee of the Philadelphia County Medical Society. The new ordinance prohibits sounding of automobile horns "except when reasonably necessary for the prevention of accidents," building operations at night except by special permit, the use of sound devices by pedlers, "unnecessary noise" in handling trash, ash and garbage cans, and the use of gongs, sirens or exhaust whistles on any vehicles except those of the police and fire bureaus, public utilities and hospitals. Loud playing of radios in homes or in front of stores is also among the specific noises forbidden in the ordinance. Penalty for the first offense is a $10 fine, for the second $25 and for the third $50. Prison sentence may be imposed for failure to pay the fine.

SOUTH DAKOTA

State **Medical Election.**—Dr. Earle A. Pittenger, Aberdeen, was chosen president-elect of the South Dakota State Medical Association at the annual meeting at Sioux Falls, May 4-8, held as a part of the Inter-Allied Professional Association. Dr. James L. Stewart, Nemo, was installed as president and Dr. John F. D. Cook, Langford, was elected vice president. Dr. Cook will continue to serve as secretary for another year to fill out his term. Next year's meeting will be in Rapid City. Dr. Burt A. Dyar, Pierre, was elected executive secretary for the interallied council.

TENNESSEE

Society News.—Dr. Ralph O. Rychener, Memphis, was elected president of the Tennessee Academy of Ophthalmology and Otolaryngology at the annual meeting in Memphis, April 13. Dr. John M. Lee, Nashville, was made president of the Tennessee Pediatric Society, which met April 14.——At the meeting of the Dyer, Lake and Crockett Counties Medical Society, May 6, speakers were Drs. David H. James and Joseph H. Francis, Memphis, on medical and surgical aspects, respectively, of megacolon; Jesse Paul Baird, Dyersburg, clinical types of ascites, and Ernest G. Kelly, Memphis, intestinal obstruction.——Dr. Marvin M. Cullom, Nashville, addressed the Davidson County Medical Society, Nashville, May 5, on "Chronicity of Sinus Disease: Its Relation to Middle Ear Infections, Deafness and Constitutional Diseases."——Dr. Russell B. Howard, Clinton, addressed the Campbell County Medical Society, Jellico, April 30, on modern therapy of syphilis. ——The Chattanooga and Hamilton County Medical Society met at Pine Breeze Sanatorium, May 7, with Drs. John Alexander Stewart, Eugene A. Gilbert and James L. Hamilton speaking on various phases of tuberculosis.——Dr. Leroy E. Coolidge, Greeneville, addressed the Greene County Medical Association, May 5, on diagnosis and treatment of goiter.

TEXAS

Incubator Babies at Exposition.—A hospital for incubator babies is a feature of the Texas Centennial Exposition, Dallas, which opened June 6. The hospital is sponsored by the Woman's Auxiliary of the Bradford Memorial Hospital and Dallas Pediatric Society. The society invites all physicians to make their headquarters in this exhibit, where a special reception room has been arranged. The physician's personal card at the door will admit him, it is announced.

VIRGINIA

Hospital Meeting. — The Tri-State Hospital Association, composed of the state associations of the Carolinas and Virginia, held its annual meeting at Old Point Comfort in April. Dr. Lewis E. Jarrett, Richmond, was reelected president of the Virginia association and Dr. Moir S. Martin, Mount Airy, was elected president of the North Carolina association. South Carolina will name its officers later.

Society News.—Speakers at a meeting of the Fauquier County Medical Society, Warrenton, April 30, included Drs. John A. Gibson, Leesburg, on "Doctors in Court and How They Should Testify" and William O. Bailey, Leesburg, "Practice of Medicine in Modern Russia."——Dr. Edwin W. Burton, University, was elected president of the Virginia Academy of Otolaryngology and Ophthalmology, May 2, at the annual meeting in Richmond. Guest speakers were Drs. Alfred Cowan and Chevalier L. Jackson, Philadelphia.——Meningitis was the subject for discussion at the annual meeting of the Clinch Valley Medical Society in Norton, April 25, at which Dr. Sara E. Branham of the National Institute of Health, Washington, D. C., was the guest speaker.

WASHINGTON

Graduate Lectures.—The twentieth annual course of medical lectures and clinics will be presented by the University of Washington, July 20-24, in Seattle. Lecturers will be:

Dr. Harvey B. Stone, associate professor of surgery, Johns Hopkins University School of Medicine, Baltimore.

Dr. James H. Means, Jackson professor of clinical medicine, Harvard Medical School, Boston.

Dr. Wilburn Smith, professor of gynecology, College of Medical Evangelists, Los Angeles.

Dr. Lewis John Pollock, professor of nervous and mental diseases, Northwestern University Medical School, Chicago.

The fee for the course, including the annual banquet, will be $10. Each evening there will be a "no-host" dinner, followed by a lecture. A trip to Mount Rainier will conclude the session. Further information may be obtained from the University Extension Division, University of Washington, Seattle.

WEST VIRGINIA

Society News. — Dr. Hugh G. Beatty, Columbus, Ohio, addressed the Cabell County Medical Society, Huntington, May 14, on "Harelip and Cleft Palate."——At a meeting of the Kanawha County Medical Society in Charleston, May 12, speakers were Drs. Archibald P. Hudgins and Howard W. Angell, on "The Sterile Couple" and "Orbital Abscess" respectively.——Dr. Austin I. Dodson, Richmond, addressed the Harrison County Medical Society, Clarksburg, May 7, on "Relations of Focal Infections to Diseases of the Urinary Tract."——Drs. Wade H. St. Clair and Dean L. Hosmer, Bluefield, addressed the McDowell County Medical Society, Welch, May 13, on "Intraperitoneal Emergencies" and "Tumors of Bone" respectively.——Speakers at a meeting of the Raleigh County Medical Society in Beckley, May 21, were Dr. Isidore I. Hirschman, Huntington, on "Peripheral Arterial Disease" and Mr. Clarence Meadows, Beckley attorney, on "The Doctor on the Witness Stand." —— Dr. Max M. Peet, Ann Arbor, Mich., addressed the Ohio County Medical Society, Wheeling, May 1, on surgery of the sympathetic system.

WISCONSIN

Illegal Practitioner to Leave State.—L. A. Carpenter, who has been practicing medicine in Prairie du Sac, pleaded guilty recently to advertising himself falsely as a physician and to treating the sick without a basic science certificate. He was released on his promise to leave Wisconsin and to remove his advertising from newspapers, farm magazines and telephone directories at once.

Graduate Courses.—Two courses of graduate lectures in obstetrics and pediatrics were begun May 18 under the auspices of the state board of health at the suggestion of the State Medical Society of Wisconsin. Social security funds are defraying the expenses. Instructors are members of the faculties of the University of Wisconsin School of Medicine, Madison, and Marquette University School of Medicine, Milwaukee. Towns in which the lectures will be given for six weeks are Manitowoc, Appleton, Waupaca, Oshkosh, Tomah, La Crosse, Whitehall, Marshfield and Stevens Point. It is expected that other courses will be planned as funds become available.

Society News. — A symposium on cancer was presented at a meeting of the Dane County Medical Society in April at Madison; speakers were Drs. James P. Dean, Samuel B. Pessin, Ernest A. Pohle, all of Madison, and Cleveland J. White, Chicago. —— Dr. Elmer L. Sevringhaus, Madison, spoke on "Endocrine Aspects of Menstrual Disturbances" at a meeting of the Outagamie County Medical Society at Appleton, April 21.——Dr. Roy D. McClure, Detroit, addressed the Medical Society of Milwaukee County, May 8, on "Artificial Fever Therapy." The Milwaukee Professional Men's Orchestra under the direction of Dr. Robert O. Brunkhorst gave a concert at this meeting.——Dr. Gilbert J. Rich addressed the Milwaukee Neuropsychiatric Society, April 23, on "Recreational Treatment of Prepsychotics."

GENERAL

Sight Conservation Classes. — The National Society for the Prevention of Blindness announces that special courses for teachers and supervisors of sight-saving classes will be offered at the summer sessions of the following schools: University of Cincinnati, University of California at Los Angeles, State Normal School at Oswego, N. Y., and Teachers College, Columbia University, New York. Details may be obtained from the university or college.

Results of Obstetric Examinations.—Fifty-nine applicants were approved for certification by the American Board of Obstetrics and Gynecology in the examinations held in Kansas City during the annual session of the American Medical Association. Twenty-two were conditioned or failed. The next written examination and review of case histories of group B applicants will be held in various cities of the United States and Canada November 7. Application blanks and booklets of information may be obtained from Dr. Paul Titus, secretary, 1015 Highland Building, Pittsburgh. Applications should be filed with the secretary sixty days prior to the scheduled date of examination.

Survey of Teaching of Preventive Medicine.—Dr. John G. Fitzgerald, dean of the faculty of medicine and director of the school of hygiene and of Connaught Laboratories, University of Toronto, is to make a survey of methods of teaching preventive medicine sponsored by the Rockefeller Foundation. Dr. Fitzgerald, assisted by Dr. Charles Edward Smith of Stanford University School of Medicine, San Francisco, will visit medical schools in the United States, Canada, the British Isles and European countries in the course of the studies. Dr. Fitzgerald will resign as dean at Toronto June 30 and will spend a year on the survey beginning September 15. It is expected that he will return in September 1937 as director of the school of hygiene and of Connaught Laboratories.

Medical Bills in Congress.—*Changes in Status:* S. 4627 has passed the Senate, proposing to create a Division of Stream Pollution Control in the Bureau of the Public Health Service. The Revenue Act of 1936, H. R. 12395, has passed the Senate, with amendments. An amendment was adopted by the Senate proposing to amend the Harrison Narcotic Act to provide that a person not registered as an importer, manufacturer, producer or compounder, and lawfully entitled to obtain and use narcotic drugs in a laboratory for the purpose of research, instruction or analysis, shall pay a special tax of $1 per annum, and shall keep such special records as the Commissioner of Narcotics, with the approval of the Secretary of the Treasury, may by regulation require.

Seminar on Physical Therapy.—The fourth annual seminar of the Western section of the American Congress of Physical Therapy will be held in Los Angeles, June 18. Dr. William Bierman, New York, as guest speaker, will discuss, among other subjects, "Clinical Use of Short Wave Currents." Speakers will include:

Dr. Julius R. Scholtz, Los Angeles, Use of Ultraviolet Radiation in Clinical Medicine, with Special Reference to Cutaneous Diseases.
Dr. Henry Borsook, Pasadena, Vitamins in Medicine.
Mr. William Rains, Los Angeles, attorney for Medical Protective Company, Legal Aspects of Physical Therapy.

Dr. Edward M. Pallette, Los Angeles, president of the California Medical Association, will be toastmaster at the annual banquet in the evening, and Dr. Bierman will discuss "Fever Therapy."

Society News.—Dr. Benjamin O. Whitten, Clinton, S. C., was chosen president of the American Association on Mental Deficiency at its annual meeting, May 4; Dr. Harry C. Storrs, Wassaic, N. Y., vice president, and Dr. E. Arthur Whitney, Elwyn, Pa., secretary. The next annual meeting will be held in Atlantic City in May 1937. —— Dr. Haven Emerson was reelected chairman of the National Committee on Maternal Health, Inc., at its annual meeting in New York, April 24; Dr. Robert L. Dickinson was named chairman of the executive committee; Dr. Frederick C. Holden, medical director and treasurer, and Dr. Howard C. Taylor Jr., vice chairman and secretary.——Dr. William S. Tillett, Baltimore, was elected president of the American Society for Clinical Investigation at the annual meeting in Atlantic City, May 4. Dr. Luther Emmett Holt Jr., Baltimore, was made vice president and Dr. Joseph M. Hayman Jr., Cleveland, secretary.——Dr. Chester M. Jones, Boston, was elected president of the American Gastro-Enterological Association at the annual meeting in Atlantic City, May 4. Drs. Ralph C. Brown, Chicago, and Ernest H. Gaither, Baltimore, were made vice presidents.—— The National Medical Association will hold its annual meeting in Philadelphia, August 16-22.

LATIN AMERICA

National Tuberculosis Council.—Announcement is made of the creation of a National Tuberculosis Council to direct antituberculosis work and the care of tuberculosis patients in Cuba. Decree law number 706, under which the council is established, provides that it will have charge of hospitals, visiting nurses and other phases of tuberculosis prevention work. A certain percentage of the proceeds from the weekly drawings of the national lottery will be placed at the disposal of the council for this work. In addition, donations legally made to this fund will be used to defray expenses. Initial funds to be collected will be used to construct a sanatorium in the Trinidad mountain section of the province of Santa Clara.

FOREIGN

Personal.—Sir Robert Muir will retire, September 30, from the chair of pathology at the University of Glasgow, according to *Science*. He has held this position since 1900. The retirement is also announced of Dr. Thomas K. Monro, who has held the chair of the practice of medicine since 1913.

Congress on Malaria.—The third International Congress on Malaria will be held in Madrid, October 12-16, under the presidency of Prof. Gustavo Pittaluga, Madrid. The secretary asks that copies of all reports and communications, with brief summaries for the press (not more than twenty lines), be sent before July 1. Applications for membership must be accompanied by two small photographs to be used in the members' personal cards, which will be essential for all matters concerning the congress as well as for reductions in transportation costs obtained by the committee on arrangements. Dr. Emilio Luengo, chief of the parasitology service at the National Institute of Health, Madrid, is secretary general of the organizing committee of the congress. Correspondence should be addressed to him at Instituto Nacional de Sanidad, Calle de Recoletos 19, Madrid.

International Conference on Tuberculosis.—The tenth conference of the International Union Against Tuberculosis will be held in Lisbon, Portugal, September 7-10, under the chairmanship of Dr. Lopo de Carvalho, president of the union. The biologic subject to be discussed is "Radiological Aspects of the Pulmonary Hilum and Their Interpretation," in discussion of which the United States will be represented by Dr. Henry C. Sweany, Chicago; the clinical subject, "Primary Tuberculous Infection in the Adolescent and the Adult," with Dr. Robert E. Plunkett, New York State Department of Health, Albany; and the social subject, "The Open Case of Tuberculosis in Relation to Family and Associates," with Dr. Charles J. Hatfield, Philadelphia, as a discusser. Application for membership and other information concerning trips to the conference may be obtained from the National Tuberculosis Association, 50 West Fiftieth Street, New York City.

Government Services

Forty States Free from Bovine Tuberculosis

Nebraska is the fortieth state to be certified as a modified accredited area in the campaign to eradicate bovine tuberculosis, the U. S. Department of Agriculture announces. Most of the tuberculin testing has been done within the past two years. It will now be necessary only to retest the various counties at regular intervals as a precaution to keep the disease from gaining another foothold.

Hospitals for Indians

Appropriations from the Public Works Administration have been set aside for hospital construction on the Blackfeet and Crow reservations in Montana, the Sisseton, Yankton and Crow Creek reservations in South Dakota, the Cherokee reservation in North Carolina, and at Cass Lake, Minn., for the Chippewa Indians, the Department of the Interior announces. The Indian Service now has under construction hospitals for the Zuni Indians in New Mexico, the Warm Springs group in Oregon, the Western Shoshone tribe in Nevada, and another at Yuma, Ariz. An Indian unit at Ah-Gwah-Ching, Minn., and a thirty-eight bed hospital on the Colville reservation, Washington, have recently been completed. The total amount made available for all these projects is $1,870,026. It is planned that about 1,000 beds will have been added to the facilities for Indians when the present and contemplated construction is finished.

Foreign Letters

LONDON

(From Our Regular Correspondent)

April 25, 1936.

The Need for Physical Education

About eighteen months ago the minister of health suggested to the council of the British Medical Association that something might be done to bring home to the public the benefits of physical culture. The result was that the council appointed a physical education committee consisting largely of physicians and others interested in physical culture. The committee has presented an elaborate report in which it makes the startling statement: "Not less than 40 per cent of the population between the ages of 14 and 40 need, but do not participate adequately, if at all, in physical recreation or training. The results are only too evident in the defective physique of large sections of the population." To raise the national standard, it is recommended that the following measures be taken at once: (1) extended provision by local authorities of facilities of all kinds for physical recreation, especially for outdoor games and swimming; (2) greater financial assistance to the physical activities of voluntary organizations; (3) closer cooperation between all agencies, whether official or voluntary, concerned with physical recreation; (4) propaganda, including the use of the cinema; (5) increased supply of qualified teachers; (6) more intimate relation between physical education and the science and part of medicine. It is pointed out that three government departments—the Ministry of Health, the Ministry of Labor and the Board of Education—are concerned with physical education. Immediate steps should be taken on a national scale for coordinated action, which might be administered by the recently formed Central Council of Recreative Physical Training. As to the relation between physical education and medicine, the report states: "Physical education has progressed from being a narrow specialty of the gynasium and games field, in the hands of instructors with limited training and apprehension, toward a national service, which aims at securing greater health, fitness and happiness for the people as a whole, irrespective of age or sex. It should take its place among the great social services as a branch of public health." Organizers of physical education should be appointed by all local authorities.

PHYSICAL EDUCATION IN SCHOOLS

Physical education in schools should include systematic gymnastic exercises, games and other activities, each playing its part in a balanced scheme of training. Gymnastic training should not be regarded as subsidiary to field games and athletic sports. Swimming should be taught as a regular part of physical education in all schools. Instruction in elementary physiology and personal hygiene as a branch of general science should be regarded as an essential part of physical education. These subjects should be taught in a practical way and should be related both to the gymnastic training and to the periodic medical examination. Local education authorities should provide suitable clothing and gymnastic shoes for children whose parents cannot do so.

THE MEDICAL SUPERVISION OF PHYSICAL EDUCATION

Physicians have hitherto been concerned chiefly with the physical treatment of the abnormal rather than the normal, and with the individual rather than the community. They have devoted attention to the cure and prevention of disease rather than the perfecting of the race. Nevertheless physicians engaged in attending communities such as industrial organizations, schools and the defense services have long been pressing the need for extending physical education to the whole population. The physician, too long absorbed in the treatment of individuals, is more and more coming to realize that he has an important part to play in furthering communal well being. The committee considers that not only should there be regular medical examinations in schools but in all matters concerning physical development and health of the individual pupil there should be close cooperation between the head master, the school doctor, the parents and the teacher of gymnastics. This is especially desirable in the prevention of strain, which girls are liable to suffer in mixed schools. Medical supervision should be available to ensure that unfit children do not participate in unsuitable or excessive exercises. Physicians should cooperate with teachers of gymnastics in investigating the physiologic requirements and effects of the various exercises with a view to the scientific arrangement of the syllabus of training. Postgraduate courses should be established to provide physicians with the special training which the medical supervision of physical education requires.

PHYSICAL EDUCATION FOR THOSE NO LONGER ATTENDING SCHOOL

To be of permanent value, physical education should be continued under expert guidance after the individual has left school. A considerable number of young people receive physical education at evening classes organized or financially assisted by the local authorities. But there is a deficiency of suitably trained leaders, and facilities for joining the classes are insufficient.

ALCOHOL AND TOBACCO CONDEMNED

The committee declares that alcoholic beverages are not necessary in physical training and may be harmful. Smoking, especially when practiced to excess and when the smoke is inhaled, is definitely injurious. Prolonged investigation has proved that excessive smoking (twenty cigarets a day) is detrimental to endurance by making the heart irritable, with consequent earlier onset of fatigue.

Features of Malignancy

At the Royal College of Surgeons, Sir Robert Muir, F.R.S., professor of pathology at the University of Glasgow, delivered the Lister Memorial Lecture on "Malignancy, with Illustrations from the Pathology of the Mamma." He gave a survey of our knowledge of malignancy. He said that experimental work on transplantation of tumors showed that the margin between growth and nongrowth was comparatively narrow, and that there were numerous human cases of malignant cells being overcome and disappearing. Once acquired, malignancy seemed to be a permanent property of the cells; they might be destroyed or die out but not regain normal behavior. Research had advanced our knowledge of the etiology, but the nearest approach to a general statement which could be made was that the acquisition of malignancy was related to previous non-neoplastic proliferation. Three conditions might lead to this: 1. Chronic irritation in its widest sense. Nothing might be known of the nature of the irritant, as is carcinoma of the cervix. 2. Compensatory hyperplasia, such as occurred in the liver after loss of its substance. 3. Hormones.

The two main theories as to the cause of malignancy were that it was the result of a change in the mechanism of the cell and that it was produced by a virus. The change in the cell appeared to be twofold: an escape from the normal growth-controlling agencies of the body and the appearance of special structural characters. The parasitic theory of cancer had passed through many phases. It was generally recognized that if a parasite was concerned it must be an invisible microbe, such as a virus. But there was no evidence that malignancy was produced by a virus or viruses entering the body from outside, and experimental facts appeared to exclude this. Growths could be set up by carcinogenic agents so regularly,

not only when applied externally but also when introduced into the tissues, that access of a virus from outside on each occasion seemed impossible. The conclusion appeared inevitable that the virus must be present within normal tissues and act only when proliferation had been set by carcinogenic agents or in some other way.

MALIGNANCY IN THE BREAST

Recent research showed that a variety of structural changes in the mammary epithelium led up to malignancy. They consisted of (1) increased and altered secretion, accompanied by changes in type of epithelium and desquamation, and (2) hyperplastic proliferation of the epithelium. The hyperplasia was attended by coordinated increase of connective tissue. Thus there arose papillomatous growth in the ducts, often associated with cystic dilatation. The next stage was relative overgrowth of epithelium in comparison with stroma. This gradually passed on to proliferation of epithelium alone. Finally, the anaplasia became distinct; the cells and their nuclei varied in size, the latter becoming vesicular with distinct nucleoli. Ultimately masses, with all the characters of encephaloid carcinoma, appeared within the ducts. He believed that local intraduct carcinoma was quite common. The cells had acquired the characters of malignancy yet were still within normal bounds—a sort of tissue culture of malignant cells still within the test tube. Ultimately there was a break through the normal bounds, with ordinary infiltrating cancer as the result.

Avian Tuberculosis in Cattle

In a letter to the *Times*, F. C. Minnett, director of the Research Institute in Animal Pathology, Royal Veterinary College, contradicts the statement made by another correspondent that only recently has undeniable proof been obtained of the danger of cattle contracting tuberculosis from poultry. In the *Journal of Comparative Pathology and Therapeutics* in December 1932 he reported five cases of tuberculosis in cattle which were proved to be due to bacilli of the avian type. These cases occurred in three calves and two adult bovines belonging to three herds. In at least one of these herds there was evidence that other calves also were affected, while in two of the herds tuberculosis was proved by tuberculin testing or by postmortem examination to exist among the fowls, which had free access to the cattle. Minnett points out that tuberculosis of the avian type is not altogether rare in mammals. It has been encountered fairly extensively in pigs, and cases have been seen in wild animals kept in captivity and occasionally even in horses, deer and sheep. In mammals the disease is usually retrogressive and therefore not serious as far as the animal itself is concerned, but cattle so affected may react for a time to tuberculin. Although it is probable that infection is generally acquired in calfhood and is overcome by the time of adult life, two of the cases recorded by Minnett were in adults, one animal being 18 months old at the time of slaughter, while the other was an old cow. The knowledge now available shows the need for preventing poultry having access to cattle unless it is certain that tuberculosis is absent.

Trachoma in Palestine

The report for 1935 of the Ophthalmic Hospital of the Grand Priory in the British Realm of the Venerable Order of the Hospital of St. John of Jerusalem, whose chancery is in London, has just been published. The number of new patients seen during 1935 was 21,116. The incidence of trachoma among them reached the extraordinary height of 92 per cent, the highest recorded in the hospital. The warden of the order states that in the most backward villages of Palestine almost all the inhabitants beyond the age of infancy have trachoma. In the larger towns the incidence is much less, though there has been an increase in the wake of a cycle of severe epidemics of conjunctivitis.

PARIS

(From Our Regular Correspondent)

April 25, 1936.

Sodium Chloride Solutions for Postoperative Toxemia

The method of treatment termed rechloridation to combat postoperative complications has been the subject of a number of papers. Max Levy of Paris read one at the January 7 meeting of the Académie de médecine, citing some remarkable results from giving intravenously a 4 per cent solution of sodium chloride. There are many deaths following operation which are difficult to explain if the more common complications are excluded. Recent studies have revealed the existence of a postoperative toxemia which may not only be checked in its incipient stages but the development of which may be prevented by the administration of sodium chloride solution in high concentration. In its mildest form, such a toxemia presents itself in the first few days following operation as a feeling of exhaustion, slight evidences of intestinal paresis, decreased urinary output and lowered blood pressure. If the symptoms increase, the malaise and weakness become more marked, the tongue is dry, the blood pressure drops more, the pulse increases in rapidity, hiccup appears and the oliguria may progress to almost complete anuria.

The evolution of this more severe clinical picture varies greatly. The symptoms may recede spontaneously and slowly or a more serious termination may ensue either with a single symptom or with a combination of symptoms. Under the former heading one may encounter cases of (*a*) coma with anuria and Cheyne-Stokes respiration, (*b*) uncontrollable vomiting resembling an acute ileum, (*c*) marked irregular elevations of temperature or (*d*) a case in which the signs of cardiovascular disturbances predominate. A fatal outcome may ensue gradually or occur with lightning-like rapidity. As the result of the work of Chabanier and Lobo-O'Nell, Levy, Legueu and Fey and of Duval, the mechanism of such a postoperative toxemia has been greatly cleared up. The following working hypotheses, the majority of which have been proved by laboratory studies, have been set up:

1. Disturbance of nitrogenous metabolism.
2. Disturbance of chloride metabolism.
3. Lack of acid-base equilibrium.

The hypochloremia does not express itself by any important sign clinically. Following operation a patient may present a marked hypochloremia and yet seem to be making an uneventful recovery. On the other hand there may be only a slight hypochloremia and grave symptoms of toxemia may be present. This lack of concordance between certain laboratory evidence and clinical signs is true also of the variations of the blood urea. The increase in residual nitrogen seems to dominate the time of appearance and degree of severity of the symptoms of toxemia (postoperative).

In a postoperative case in which either the milder or more severe symptoms appear as previously mentioned, a chemical analysis of the blood and urine should be made immediately. The blood examination must include percentage of urea, plasma and globular chloride content and glycemia. The urine examination embraces percentage of urea, chlorides and acetone. All the results can be obtained within two hours. The marked decrease or complete disappearance of chlorides in the urine gives one the best idea of the degree to which chlorides have been withdrawn from the blood and tissues to be lodged in the operative zone. One should begin the treatment by the administration very slowly of 20 cc. of a 4 per cent solution of sodium chloride. The total amount of sodium chloride to be injected during the first and following days depends first on the degree of dechloridation. The more marked the diminution of chlorides in the urine, the more sodium chloride should

be given. Secondly, the patient whose symptoms of toxemia are very serious requires a larger amount of sodium chloride, i. e., more rechloridation, than a patient with only mild toxemia. Thirdly, the longer the symptoms have lasted, the more sodium chloride is needed. Twenty cc. is inadequate if all three of these are very marked. Under these circumstances the first dose should be from 30 to 40 cc. of the 4 per cent solution followed in from eight to twelve hours by a second one of 20 cc.

The blood and urine should be examined daily and the treatment continued until the blood chlorides and urea have returned to the normal figure, the quantity of urine is greatly increased, and all clinical symptoms have receded. In general, it suffices to give between 20 and 30 Gm. of sodium chloride the first day, between 10 and 20 the second day and between 5 and 10 the third.

The results of this rechloridation treatment have been most gratifying, especially following abdominal operations in general surgery and after prostatectomy.

Immediate versus Late Operation in Acute Osteomyelitis

A discussion took place at the March 4 meeting of the Académie de chirurgie as to whether the classic method of immediate operation in cases of acute osteomyelitis should be replaced by expectant treatment until a subperiosteal abscess has appeared. Leveuf advocated the latter method, basing his opinion on experience in sixteen cases. The shortest interval in which operation was performed was three days, the longest forty days. In fifteen of the sixteen patients only an abscess was drained. In one of the sixteen an operation (resection) was necessary in a case of acute osteomyelitis of the lower end of the radius with separation of the epiphysis. The presence of Staphylococcus aureus was demonstrated in all sixteen cases (children and adolescents). The best two methods of following the spontaneous evolution of an acute osteomyelitis are to observe the recession of the fever and the results of the blood cultures. The former reaches the normal level at about the fifteenth day in the average case after admission to the hospital. With the drop in temperature, an improvement in the general condition can be noted. This is especially striking in cases in which the onset has been accompanied by symptoms of severe toxinemia.

The results of hemoculture are also a good criterion of the progress of the case. In cases of acute osteomyelitis which terminate in death and in which early operation has been of no avail the blood cultures remain positive throughout the period of clinical observation. In the sixteen cases in which operation was delayed, the hemoculture was negative in six. It was positive in the ten other cases on one or several occasions. The hemoculture remains positive from five to twenty-five days after admission to the hospital. At times the hemocultures that were positive become negative even when no operation has been performed. In others the hemocultures remain positive until after the abscess has been incised. In one case the hemocultures remained positive even after such an incision. In general, one can say that there is a certain relation between the severity of the osteomyelitis and the persistence of positive hemocultures. Radiography reveals bone changes at the end of fifteen days in the form of sequestrums, which serve as indications for operation; but these sequelae are minimal if one waits. Expectant treatment does not have a harmful influence on the bone lesions. This is especially true of osteomyelitis of the neck of the femur, as Ombredanne and Petit have already shown. Leveuf believes that early operations open bone and muscle areas where the defense against the toxins of Staphylococcus aureus has not yet been organized. The only danger of delayed operation is involvement of a joint adjacent to the osteomyelitic focus. Leveuf saw this in only one case. In such cases, early resection is indicated.

The discussion was opened by Bazy, who stated that the same principle of waiting until local defense has been established is true of peritonitis, empyema and infections involving soft tissues as well as in acute osteomyelitis. Sorrel believed that the teachings of Leveuf if carried out indiscriminately would lead to dangerous results. Mathieu also endorsed early operation, with the proviso that one should remove as little bony tissue as possible. The possible extension to an adjacent joint was also a reason why operation should not be delayed too long.

Grégoire said that he had opposed immediate operation ten years ago. He had been influenced in arriving at this opinion by the excellent results obtained by giving antistaphylococcus vaccines in cases of acute osteomyelitis. The only criticism to be made against the vaccine treatment is that it is too simple and hence a dangerous weapon in the hands of those who do not fully understand the pathology of acute osteomyelitis. A vaccine should not be used indiscriminately but only when there is a recrudescence of the fever.

BERLIN

(From Our Regular Correspondent)

April 22, 1936.

Nature Medicine and "New German Medicine"

News of these movements have been reported from time to time in THE JOURNAL. It can almost be said that no fundamental difference exists between the two groups. The attempt has been made by the use of more forceful propaganda to penetrate the circle of those physicians who have been trained to think rationally and to practice accordingly. Numerous books on the subject are being printed. A few characteristic features of this literature will be mentioned. First of all, mention must be made of the "Biologic-Medical Pocket Manual" published by the director of the museum of hygiene at Dresden, Professor Martin, in collaboration with twenty-nine "physicians and scientists." This work is dedicated to that "New German Medicine" with which the national führer of medicine, Dr. Wagner, is closely identified and which he has done so much to further. "The New Medicine," says Dr. Wagner in a sort of introductory harangue with which the book begins, "cannot be founded on science in the strict sense of the term but rather on the National Socialist weltanschauung as it affects the fundamental nature and biologic laws of all happenings." The collaborating "scientists" have gone about their task with this idea in mind. The section of the book on nutrition rests principally on the teachings of the Zurich physician Dr. Bircher-Benner, who has made a German reputation through his courses and lectures within the reich. The physical methods are quite expertly worked out but they are carried far beyond their legitimate boundaries. Among other methods endorsed is that of treatment with multiple irritant punctures, although the use of this procedure in earlier times forms one of the darkest chapters in medical history. Artificially induced suppurations also are recommended. Treatment with medicaments shows the usual backward trend exemplified by the grossly exaggerated recommendations of vegetable preparations the efficacy of which remains to be demonstrated in actual practice. The book contains a pernicious advertisement section, a good example of how the unbelievable may actually come to pass. Here a language utterly different from that of standard medical literature is frequently encountered. Arsphenamine is not entirely dispensed with, although its use is expressly termed "provisional." This booklet of nearly 600 pages sells for the modest price of 3.50 reichsmarks and may be easily obtained by the medical profession as well as by the public (the distinction between physician and layman is no longer regarded as fundamental). The work would no doubt make amusing reading for the Council on Pharmacy and Chemistry.

Under present conditions, with these new doctrines receiving governmental sanction, it seems remarkable that a dissenting voice should be heard. Prof. F. O. Hess, hospital director in a city of medium size, has spoken his mind on the subject before the regional medical union. In the near future Nature Medicine and Biologic Medicine are to have a hearing in open convention, and one can scarcely wait until this comprehensive airing of the opposing points of view takes place. There exists today a danger of authentic factual data being shaken and upset by unproved assertions. As examples, Hess cites the widespread disuse of serotherapy, of vaccination against smallpox and the doubtful attitude toward all diagnostic methods. Physicians must reject those accounts of manifestly superior results which appear in popular publications together with a dig at scientific medicine. Such popular articles pass over in silence the accomplishments of regular medicine in the field of infectious diseases. Interesting sidelights are furnished by the discussion which followed this address. The Rudolph Hess Hospital of Dresden, which has dedicated itself to these Nature Cure methods, is now treating venereal diseases, notably gonorrhea and syphilis, exclusively with Nature Cure procedures. As the local dermatologic society has expressly stated, such treatment obviously is harmful to the patient and in addition fails to protect others, including future generations, from the infection.

The treatment of appendicitis, as described in a widely circulated "Handbook of Nature Medicine" by Brauchle, calls to mind the therapeutic methods of the year 1750, when medical science knew no better. A movement which advocates the use of poultices, fasting, purges and clysters in the treatment of appendicitis cannot be regarded as other than a decided backward trend of medical progress. The direction here taken by Nature Medicine imperils all the advances of proved worth in the treatment of the disease. From this noteworthy controversy physicians in other countries are able to form a good picture of the German situation.

In the same issue of the *Münchener medizinische Wochenschrift* that carries an account of these events, it is announced that the second International Congress on the Diagnosis of Iridal Disorders will be held at Nuremberg in May. Topics will be "Diagnosis of Iridal Conditions in Relation to General Diagnostic Methods" and "Diagnosis of Iridal Conditions in Digestive Disorders, with Especial Consideration of Differential Diagnosis." At the same time the national convention and centenary celebration will be held at Nuremberg, the center of the Nature Cure movement.

The sort of material it is possible to find in contemporary professional publications is exemplified by the following advertisement, which appeared in a widely circulating medical weekly toward the close of 1935: "Therapeutic Magnetizer with Complete Especially Strong Magnetizing Powers—Can Light Incandescent Bulbs of 220 Volts by Contact—Situation Wanted. Address . . ."

It will be interesting to see what the previously mentioned joint convention of "New German Medicine" and the "German Society of Internal Medicine" holds in store.

German Women in the Professions

The number of active German academicians (university graduates with professional careers) is estimated at around 350,000. What proportion of this number are women can be determined from statistical reports of several professional groups. The National Medical Almanac, for example, and the statistics compiled by the League of German Women Physicians place the total number of women physicians in the German reich and Danzig as of 1935 at 3,675. This figure represents an increase of 8 per cent over 1932. Of these women 278 (7.6 per cent) are no longer professionally active. Those employed, that is, occupying regular posts, number 888 (24.2 per cent), an increase over 1932. On the other hand, the percentage of women physicians in independent practice has decreased from 74 (in 1932) to 62.2. Of these 2,509 independent women practitioners the vast majority are in general practice; only 28.5 per cent are specialists. How strongly women feel drawn toward pediatrics is shown by the fact that 43 per cent (309) of the specializing women physicians are pediatricians. After pediatrics, other specialties engaged in by women follow at a considerable distance; thus, ninety-seven women gynecologists form 13.6 per cent of the total, seventy-four women ophthalmologists 10.4 per cent and sixty-six women internists 9.2 per cent. Geographic distribution of female physicians is remarkably uneven throughout the reich. Berlin contains 20 per cent of the professionally active women physicians, 518 in private practice, 153 occupying positions. In Berlin also is the largest proportion of women specialists, of whom forty-eight, nearly 36 per cent, are pediatricians; and yet whole provinces are without more than one or two women gynecologists each.

Of a total of about 52,000 German physicians, 7 per cent are women. The percentage of women admitted to the sick insurance practice is still smaller; of 31,146 insurance physicians, 1,224 (3.97 per cent) are women. Since the officially authorized national insurance societies numbered 6,250,000 females among their membership in 1933, it will be seen that the number of female physicians capable of treating female insurance patients is also quite small. Within the last few years 300 non-Aryan women physicians were excluded from the insurance practice on racial grounds, while in 115 other instances of license revocation the physicians were chiefly married women and the purpose was to eliminate the so-called state of double earning. In 1934, 348 women began the study of medicine, as against 889 in 1933 and 1,151 in 1932.

According to official statistics for 1933, of a total 12,120 dentists, 1,250 were women. Of these women dentists, 692 were independent and 558 employed. The proportion of males to females was the same as among the medical profession; the women formed 7 per cent of all practicing dentists. The decline in the number of female dental students has been even greater than the decline in the number of female medical students; in 1934 only sixty-two women began the study of dentistry, against 357 in 1932.

In 1933 the profession of veterinarian was followed by fifty-three women. Only a few of this group, namely, fifteen, were independent, the other thirty-eight being employed. While twenty women are students of veterinary medicine in the universities, only one woman began a course of study in this field in 1934.

According to official records there were 3,716 women pharmacists in 1933, including those undergoing training. A new report for 1934 lists 104 pharmacy proprietresses, 425 employed women pharmacists and 1,064 women pharmacy assistants—altogether 1,593 women in a total of 14,128 pharmacists of both sexes. There were besides in the same year 727 women pharmacy apprentices. Restriction of the number of pharmacies in which apprenticeships may be filled has caused a decline in the number of apprentices. More than 50 per cent of male pharmacists are independent proprietors, but not 7 per cent of the women reach this goal.

One of the most important academic professions with regard to women is that of "teacher in the higher schools." Among a total 37,505 teachers of this rank, including school heads, 5,428 women were listed.

While the number of female political economists is unknown, there were in 1933 thirty-six women judges and 251 women lawyers. In 1934, 104 women passed the second examination in jurisprudence. How small the future generation of women attorneys will be is illustrated by the fact that in 1934 only

seventeen women began the study of law. Figures for 1933 show 168 women among the evangelistic ministers and missionaries.

Compared with the total number of women in gainful occupations (around 11,500,000), women in the foregoing professions constitute a relatively small group. There were twenty-six women listed as lecturers on the university faculties for the winter semester 1935-1936. None of these women held full professorships, thirteen were unofficial extraordinary professors, and the remaining thirteen were instructors (privatdozentinnen, according to the previous designation). The twenty-six women members of the university faculties were distributed as follows: Berlin 6; Hamburg 5; Munich 4; Breslau, Giessen and Heidelberg, two each; one each at Göttingen, Düsseldorf (the Academy of Medicine), Jena, Marburg and Würzburg. The remaining German universities have no women faculty members. The following fields of specialization are represented by the twenty-six women lecturers: eight women profess as many medical specialties; namely (1) anatomy, (2) genetics, (3) ophthalmology, (4) hygiene and bacteriology, (5) dermatology and venereology, (6) pharmacology, (7) pathologic physiology and (8) dentistry. Fields other than medicine and the number of women professing therein are international law and jurisprudence one, political economy three, philology three, psychology and pedagogy three, natural sciences a total of eight of which four are in botany (which includes plant genetics), and one each in oceanography, zoology, chemistry and physics.

BELGIUM

(From Our Regular Correspondent)

April 24, 1936.

International Congress for Juvenile Protection

The International Congress for Juvenile Protection, which recently met at Brussels, held that attendance at establishments for children of preschool age should not be compulsory; furthermore, that governments should see that all such institutions possess (1) a teaching staff especially trained to deal with children of this age, (2) medical supervision that guarantees adequate puericulture (physical and moral upbringing of the children) and (3) a competent assisting personnel, the members of which while not exceeding their authority know how to facilitate the harmonious cooperation of the teachers, the physicians and the children's relatives. Additional recommendations of the conference were that the parents should be kept constantly informed as to the child's progress; that relatives, and mothers in particular, should be given as much beneficial instruction as possible, and that a record of the child's health should be maintained by cooperation on the part of the family and of the infant welfare organizations, the latter being subsequently replaced by other organizations with which the child of school age shall come in contact.

The Belgian Puericulture Centers

Under the auspices of the Belgian Puericulture Centers a model pediatric clinic has been built. The center for supervised familial placement will be temporarily housed at the clinic until the construction of its own new building on the outskirts of Brussels has been completed.

The puericulture clinic was formally opened in December 1933 by the queen, then duchess of Brabant. In it are hospitalized healthy children less than 6 years of age and children suffering from debility or noncontagious diseases who are unable to receive maternal care. When the mother is widowed or deserted the clinic takes in both mother and child. The children are isolated in tiny individual cubicles, which open on wide, covered balconies and which are separated one from the other by glass partitions. Each of the cubicles is equipped with a special ventilating apparatus, a smooth radiator, easily washed, and a bath tub with hot and cold running water. Each child's necessaries are kept in little individual glass wardrobes. Each upper story of the hospital building recedes from that directly below it and the width of these setbacks corresponds to that of the balconies. By this arrangement every floor of the building receives an equal amount of daylight.

The prescribed regimen for each little patient is prepared by the dietitians in a special diet kitchen. Direct communication is maintained between the diet kitchen and the pantries of each upper floor by means of an electrical dumbwaiter. By means of a pneumatic tube system, written dietary instructions can be transmitted without going astray. Sleeping apartments are especially designed for the care of prematurely born infants. This manner of housing the prematurely born has replaced the incubator, which obsolescent device is no longer used in modern pediatric institutions. The premature babies are cared for by a specially trained personnel which has charge of the constant feedings of breast milk. An operating room is equipped for minor surgical procedures. Children suspected of harboring contagious diseases are kept in the strictest isolation. Spacious reception rooms and consultation rooms are situated on the ground floor.

In addition to indigent children and children confided to its care by welfare organizations, the foundation accepts as patients the children of well-to-do parents. The income realized from the boarding of children of the latter class, small though it may be, enables the clinic to take better care of the less fortunate little ones. The institution is conducted on a strictly nonprofit basis.

Recently a school has been established in connection with the clinic which offers instructions in the theory and practical application of puericulture. Every student who passes the final examination receives a diploma in puericulture. The curriculum is designed for young girls possessing a general education and background at least of secondary school level, as well as for midwives and social workers who wish to complete their training in puericulture. The regular course covers a period of four semesters, but this is reduced to two semesters for social workers and to one semester for graduates in nursing and obstetrics. Students are required to reside at the clinic.

SWITZERLAND

(From Our Regular Correspondent)

April 20, 1936.

The Organization of the Swiss Medical Profession

In Switzerland the foundation of the organized medical profession is the Verbindung der Schweizer Aerzte (League of Swiss Physicians), which, according to its constitution, draws its membership from the cantonal organizations affiliated with three linguistically differing groups: the Verband deutschschweizerischer Aerztegesellschaften (Federation of Medical Societies of Germanic Switzerland), the Société médicale de la Suisse Romande (Medical Society of French Switzerland) and the Ordine dei medici del cantone Ticino (League of Physicians of Ticino Canton [Italian Switzerland]). The Verbindung der Schweizer Aerzte is the ranking official organization of the Swiss medical profession. Among its aims may be mentioned investigation of scientific questions and promotion of advanced medical study, protection of professional interests by its power to make and to enforce suitable regulations in particular circumstances, and representation of the will of the Swiss medical profession in questions of public health and the control of disease. The verbindung's legislative authority is vested in the Schweizerische Aerztekammer (chamber of Swiss physicians), which is composed of delegates from the several cantons. Each cantonal organization is entitled to elect one delegate and one alternate for each fifty members or fraction thereof. The term

of office is three years. The aerztekammer holds a regular annual session and may be called into special session if circumstances warrant.

The executive power of the verbindung rests with a central executive committee, the personnel of which is selected by the aerztekammer from among the physicians of the verbindung.

Decisions of the aerztekammer become binding on the entire membership of the verbindung if within two months of their announcement no objection has been raised by at least three cantonal organizations. The Verbindung der Schweizer Aerzte is concerned only with those political questions which in some way involve the profession. Now and then such questions may have economic implications. The actual protection of the medical profession's economic interests in the narrowest and most literal sense of the term is the function of the Aerztesyndikat für die Wahrung wirtschaftlicher Interessen (Syndicate for Protection of the Economic Interests of Physicians). Membership in the verbindung carries with it automatically membership in the syndicate. The verbindung is a nonprofit association in the eyes of the civil code, while the syndicate, because of its economic activities and the extent of its financial interests, is organized along the lines of a business corporation. The syndicate protects the interests of the physicians in dealings with medical supply houses and their organizations, procures privileged contracts with the insurance societies, functions as a collection agency, provides legal counsel and handles all economic questions which may be referred to it by the central executive committee of the verbindung.

Finally, there is the Swiss Physicians' Old Age and Life Insurance Society, founded Jan. 31, 1926. Any doctor who belongs to the verbindung and the syndicate may become a member and, by virtue of mutual agreements, members of the Society of Swiss Veterinarians and members of the Swiss Dental Association are considered eligible. In evaluating the importance of old age insurance and life insurance for the Swiss doctor, the syndicate has been influenced by the consideration that not so long ago the physician was scarcely in a position to save money without a certain compulsion being exercised. A holding in the insurance society, however, meant a compulsory putting by of at least 100 francs a year. This old age and life insurance society forms an integral part of professional organization.

The Verbindung der Schweizer Aerzte maintains as an adjunct its own legal tribunal a medical council of honor for the adjudication of internal disputes.

The Schweizerische Aerztezeitung, founded in 1920, serves as official organ of the entire medical profession. It endeavors to keep the physician informed on current medical topics and also contains news of the national and cantonal organizations. The price of subscription is included in and amounts to some 12 per cent of the annual (verbindung) dues.

Various procedures govern the payment of dues. The syndicate exacts nothing in the way of contributions from its membership. Since it is incorporated for profit and has to date limited itself to strictly business transactions, it can afford to waive any special levy on its members. The verbindung requires annual dues of 30 francs from its regular members. For physicians in official positions this amount is reduced to 15 francs, and the cantonal societies may obtain reductions for other doctors in special circumstances (beginning practice, withdrawing from practice and so on). Doctors purchasing old age and life insurance are permitted to choose among many differently regulated types of insurance; annual payments may be anywhere from 100 to 2,000 francs.

The Verbindung der Schweizer Aerzte numbered 3,368 regular members in 1935; including extraordinary (or special) members the figure is 3,987.

Of the authoritative rulings of the aerztekammer, some are worthy of mention: With regard to the factory physician, for example, although his importance as custodian of the worker's health is acknowledged, the chamber forbids him to hold office hours for therapeutic counsel. Such a procedure, it is held, is counter to the present-day concept of the patient's free choice of a physician. For a doctor to hold regular consultation hours away from his own residence and in a locality where one or more other doctors are already practicing is deemed a breach of professional ethics, especially if unjustified by a prolonged residence in the locality or by some manifest public need.

The next topic discussed is "The Regulation of the Specialization Question." In the last few years, an increasing number of rulings have been made with regard to specialization. The present arrangement is somewhat as follows: A specializing physician may work in his particular department either exclusively or incidentally; he may use at the same time the title of a specialist and that of a general practitioner. Use of this double nomenclature, however, may be forbidden by the cantonal medical societies.

As specialties only the following fields are officially recognized: surgery, dermatology, obstetrics, gynecology, internal medicine (with its particular subdivisions such as heart, lungs, stomach, intestine, metabolism), neurology, ophthalmology, orthopedics, otorhinolaryngology, pediatrics, psychiatry, radiology, tropical medicine, urology and venereology. To obtain the authorized title of "spezialarzt" (specializing physician) a doctor must have received special training in a medical establishment of high enough rating to guarantee an adequate preparation. Prerequisites of special training are as follows for the various fields: surgery four years (one year of which must represent training in another branch of medicine); dermatology two years plus one year in a second field; obstetrics four years plus one year in a second field; gynecology the same as for obstetrics; internal medicine with its subdivisions two years plus one year in a second field; neurology as a single specialty two and one-half years' study at a neurologic institute of university rank plus one-half year at a psychiatric clinic besides one year of additional study, half of which is to be spent in a medical clinic (that is, a clinic of internal medicine); ophthalmology three years of special preparation plus a recommended but not obligatory one year's study in a second field; orthopedics two years plus two additional years of surgery; otorhinolaryngology four years, of which at least two years is to be devoted to special training in this field and from one to two of the remaining years to the study of a second field; tropical medicine no particular stipulation, each case to be judged according to expediency; urology two years plus one year in a second field; venereology the same as for urology. These requirements are subject to modification in exceptional cases if the candidate succeeds in passing a special examination.

The customary procedure is for the central executive committee of the Verbindung der Schweizer Aerzte, with the approval of the society that represents the special field in Switzerland, to confer on all candidates completing one of the courses of training indicated above the title of "spezialarzt." Moreover, a doctor is permitted to specialize simultaneously in certain combinations of fields: surgery and gynecology, obstetrics and gynecology, dermatology and venereology, psychiatry and neurology.

On the other hand the Swiss aerztekammer has declined to recognize as special branches of medical science "forensic medicine," "laboratory research," "psychotherapy" and "tuberculosis." The rejection of the last named, "tuberculosis," means that work in the field of that disease is not regarded as constituting a separate category but rather as coinciding with the work of a recognized special sphere such as internal medicine (pulmonary diseases) or surgery.

Marriages

DANIEL J. SULLIVAN, Trenton, N. J., to Miss Anne E. McKann of Samos, Va., in Washington, D. C., May 30.

GLEN WARD LEE, Anderson, Ind., to Miss Edith Anne Hoopingarner of Indianapolis, May 9.

MAX MARTIN GOULD to Miss Frances Matilda Schenker, both of Hartford, Conn., May 24.

HERMAN T. COMBS to Miss Mildred Ruth Long, both of Evansville, Ind., May 12.

CHARLES F. SCHNEE to Miss Ada Daniel, both of Maspeth, N. Y., May 20.

Deaths

Frederic William Baldwin ⊕ Danvers, Mass.; Harvard University Medical School, Boston, 1886; past president of the Essex South District Medical Society; formerly chairman of the board of health of Danvers; aged 74; one of the founders and on the staff of the Hunt Memorial Hospital; on the staff of the Beverly (Mass.) Hospital, where he died, March 7, of thrombophlebitis and pulmonary embolism.

Henry Harve Look, Kansas City, Mo.; Marion-Sims College of Medicine, St. Louis, 1899; member of the Missouri State Medical Association; formerly assistant professor of ophthalmology, University of Kansas School of Medicine, Kansas City, Kan.; served during the World War; for many years on the staff of St. Joseph Hospital; aged 59; died, March 14, of pneumonia.

Robert **Aurand Allen** ⊕ Major, M. C., U. S. Army, Fort Wadsworth, N. Y.; Northwestern University Medical School, Chicago, 1906; served during the World War; entered the medical corps of the U. S. Army as a major in 1920; aged 58; died, February 8, in the Walter Reed Hospital, Washington, D. C., of myeloma and nephritis.

George E. Davis, West Mansfield, Ohio; Eclectic Medical Institute, Cincinnati, 1895; member of the Ohio State Medical Association; past president of the Logan County Medical Society; a member of boards of education in various towns; aged 75; died, March 20, in the Mary Rutan Hospital, Bellefontaine, of erysipelas.

Millard F. Hussey, Sidney, Ohio; Medical College of Ohio, Cincinnati, 1891; for many years a member of the board of education; at one time superintendent of the Lima (Ohio) State Hospital; formerly chief of staff of the Wilson Memorial Hospital and physician for the Shelby County Home; aged 79; died, March 12.

William Edward Knewstep ⊕ Hampton, Va.; Medical College of Virginia, Richmond, 1911; formerly secretary of the Elizabeth City and County Medical Society; served during the World War; on the staff of the Dixie Hospital; aged 46; died, March 24, in the Johns Hopkins Hospital, Baltimore, of miliary tuberculosis.

Frank Thomas De Lano ⊕ Rockville Centre, N. Y.; Albany Medical College, 1883; in 1904 served as president of what was then known as the Queens-Nassau Medical Society; for many years president of the bank, board of education, and public library; aged 79; died, March 28, of diabetes mellitus.

Alfred Henry Heald ⊕ Berkeley, Calif.; University of California Medical School, San Francisco, 1931; instructor in pathology and roentgenology at his alma mater; on the staff of the Mills Memorial Hospital, San Mateo; aged 38; died, March 12, of cerebral embolus and chronic heart disease.

Frank Hayes Johnson, Carrizozo, N. M.; Chattanooga (Tenn.) Medical College, 1903; member of the New Mexico Medical Society; vice president of the state board of medical examiners; formerly county health officer; served during the World War; aged 53; died, March 19, of pneumonia.

William Cotman Whitmore ⊕ Major, M. C., U. S. Army, Governors Island, N. Y.; Medical School of Maine, Portland, 1909; served during the World War; entered the medical corps of the U. S. Army as a lieutenant in 1917 and in 1929 was appointed a major; aged 51; died, April 17.

John Howard Johnson, Windermere, Fla.; Cleveland University of Medicine and Surgery, 1897; at one time a practitioner in Wauseon, Ohio, where he was a member of the board of education and county coroner; formerly mayor of Windermere; aged 62; died, March 20.

Milo Ruben Hewitt, Hartland, Wis.; Bellevue Hospital Medical College, New York, 1869; professor of obstetrics at the Milwaukee Medical College, 1894-1897; formerly on the staff of the Milwaukee County Hospital; aged 91; died, March 8, of bronchopneumonia.

George Sawyer Pitcher, Hampton, Va.; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1889; veteran of the Spanish-American War; for many years connected with the U. S. Public Health Service; aged 72; died, March 8.

Robert Lee Harris ⊕ Cleburne, Texas; Marion-Sims College of Medicine, St. Louis, 1896; past president and secretary of the Johnson County Medical Society; owner and medical superintendent of the Cleburne Sanitarium; aged 69; died, February 9, of pneumonia.

Thomas Ellis Drewry, Griffin, Ga.; Atlanta Medical College, 1887; Jefferson Medical College of Philadelphia, 1890; member of the Medical Association of Georgia; aged 75; died, March 18, in the Strickland Memorial Hospital, of coronary occlusion.

Verner Paul Johnson ⊕ Delano, Minn.; University of Minnesota Medical School, Minneapolis, 1927; president of the Wright County Medical Society; aged 34; died, March 18, in the Fairview Hospital, Minneapolis, of acute lymphatic leukemia.

Albert Fredrick Heising ⊕ Menomonie, Wis.; St. Louis Medical College, 1890; past president of the Dunn County Medical Society; aged 70; died, March 27, in St. Joseph's Hospital, St. Paul, of carcinoma of the rectosigmoid with metastasis.

Addison Barrett Housholder, Lovettsville, Va.; University of Maryland School of Medicine, Baltimore, 1893; member of the Medical Society of Virginia; on the staff of the Frederick (Md.) City Hospital; aged 66; died, March 20, of heart block.

Stanley R. Hare, Batavia, N. Y.; Syracuse University College of Medicine, 1920; member of the Medical Society of the State of New York; on the staff of St. Jerome's Hospital; aged 39; died, March 26, of gastric ulcer and hemorrhage.

Frank J. Flannery, Baltimore; University of Maryland School of Medicine, Baltimore, 1880; for many years resident physician at the Mount Hope Retreat; aged 77; died, March 11, in St. Agnes' Hospital, of carcinoma of the prostate.

Jefferson Gould, Fenton, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1888; member of the Michigan State Medical Society; aged 84; died, March 21, of cerebral hemorrhage and arteriosclerosis.

Harry Cannon, San Diego, Calif.; Washington University School of Medicine, St. Louis, 1904; formerly state senator in Minnesota; aged 63; died, March 23, in the Mercy Hospital, of coronary occlusion, arteriosclerosis and hypertension.

Otto Herman Friedemann, La Grange, Ill.; Rush Medical College, Chicago, 1927; member of the Illinois State Medical Society; aged 38; died, March 29, in the Albert Merritt Billings Memorial Hospital, Chicago, of coronary occlusion.

Samuel J. Firestone, Cleveland; Fordham University School of Medicine, New York, 1916; served during the World War; on the staff of the Mount Sinai Hospital; aged 43; died, March 3, in the Cleveland Clinic, of pneumonia.

William McClure Leslie ⊕ Blackwell, Okla.; Baylor University College of Medicine, Dallas, Texas, 1916; owner of a sanatorium bearing his name; aged 46; died, March 25, of streptococcic infection of the blood stream.

Richard Deyo Dugan, Springfield, Ill.; Missouri Medical College, St. Louis, 1899; member of the Illinois State Medical Society; served during the World War; aged 59; died, March 23, of coronary thrombosis.

Herman Christian Galster, Erie, Pa.; Cleveland Medical College, 1892; member of the Medical Society of the State of Pennsylvania; aged 73; died, March 17, in St. Vincent's Hospital, of hypertensive heart disease.

David Herbert Richardson, Celina, Ohio; Starling Medical College, Columbus, 1869; Medical College of Ohio, Cincinnati, 1879; member of the Ohio State Medical Association; aged 87; died, March 20, of heart disease.

Thomas Eggleston Burrows, Surrey, England; University of the City of New York Medical Department, 1877; L.K.Q.C.P., Dublin, Ireland, 1887; died, March 8, in Sherborne, N. Y., of bronchopneumonia and arthritis.

Wenceslaus J. Hovorka, St. Paul; Medical Department of Hamline University, Minneapolis, 1897; aged 78; died, March 27, in the Midway Hospital, following transurethral prostatectomy and osteomyelitis pubis.

Peter N. Hoover ✠ Boonville, Ind.; Kentucky School of Medicine, Louisville, 1881; past president of the Warrick County Medical Society; aged 84; died, March 31, of cardiac insufficiency and influenza.

Dildy McCowan Austin ✠ Belen, N. M.; Tulane University of Louisiana School of Medicine, New Orleans, 1930; aged 30; died, March 28, in St. Joseph's Hospital, Albuquerque, of amytal poisoning.

Benjamin Franklin Cain, Cincinnati; Marion-Sims College of Medicine, St. Louis, 1899; Medical College of Ohio, Cincinnati, 1900; aged 67; was found dead in bed, March 27, of heart disease.

William James Hardy, Belmont, N. Y.; New York Homeopathic Medical College and Hospital, 1889; formerly member of the board of education; aged 74; died, March 14, of myocarditis.

John Fred Gordon, Otway, Ohio; University of Louisville (Ky.) Medical Department, 1894; member of the Ohio State Medical Association; aged 66; died suddenly, March 27, of heart disease.

Arthur Levi Knight ✠ Cincinnati; Miami Medical College, Cincinnati, 1890; aged 69; formerly on the staff of the Good Samaritan Hospital, where he died, February 29, of lobar pneumonia.

Frank Bozeman King, Houston, Texas; Kentucky School of Medicine, Louisville, 1885; member of the State Medical Association of Texas; aged 72; died, March 14, in St. Joseph's Infirmary.

Frank L. Baker, Burlington, W. Va.; College of Physicians and Surgeons, Baltimore, 1889; member of the West Virginia State Medical Association; aged 74; died, March 24, of cerebral embolism.

James Blain Hannah, Addyston, Ohio; Medical College of Ohio, Cincinnati, 1885; member of the Ohio State Medical Association; aged 79; died, February 19, of coronary thrombosis.

Frederic Theodore Underhill, Vancouver, B. C., Canada; L.R.C.P., Edinburgh, 1881; F.R.C.S., Edinburgh, 1884; D.P.H., R.C.S., Edinburgh, F.P.S., Glasgow, 1897; died, February 17.

Enrico Raffaele Gnasso ✠ Fort Lee, N. J.; Birmingham (Ala.) Medical College, 1913; medical advisor for the local board of health; aged 55; died, March 22, of coronary sclerosis.

Horace Winter Miller, Philadelphia; University of Pennsylvania Department of Medicine, Philadelphia, 1889; aged 70; died, March 6, of bronchopneumonia and mitral insufficiency.

Charles Tom Cook Wilson, Champaign, Ill.; Cincinnati College of Medicine and Surgery, 1890; aged 67; died, March 24, in the Carle Memorial Hospital, of cerebral hemorrhage.

George W. Ragsdale, Hiram, Ga.; University of Georgia Medical Department, Augusta, 1902; past president of the Paulding County Medical Society; aged 58; died, March 25.

Samuel Holt Toy, Umatilla, Fla.; Kentucky School of Medicine, Louisville, 1882; member of the Florida Medical Association; aged 85; died, February 24, of arteriosclerosis.

George Nelson Drysdale, Crescent City, Calif.; Halifax Medical College, Halifax, N. S., Canada, 1891; fellow of the American College of Surgeons; aged 69; died, March 15.

Edward F. De Vaux ✠ Fort Wayne, Ind.; American Eclectic Medical College, Cincinnati, 1893; aged 76; died, March 8, of myocarditis, diabetes mellitus and infective arthritis.

John Tandy Stewart ✠ Indianapolis; Eclectic Medical College, Cincinnati, 1928; on the staff of the Methodist Episcopal Hospital; aged 34; died, March 9, of chronic myocarditis.

Norman W. Gustine, Cleveland, Texas (registered in Texas by the State Board of Medical Examiners, under the Act of 1907); aged 81; died, in March, of heart disease.

G. W. Nelson, Marshallville, Ga.; College of Physicians and Surgeons, Baltimore, 1882; member of the Medical Association of Georgia; aged 73; died suddenly, February 26.

Stanley Arnold Seigle, Wyncote, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1932; aged 26; died, March 27, of Hodgkin's disease and cerebral embolism.

James Marion Kerns, Malad City, Idaho; Hospital College of Medicine, Louisville, Ky., 1898; served during the World War; aged 58; died, March 9, of cerebral hemorrhage.

Henry Stokes Lott, Winston-Salem, N. C.; University of Georgia Medical Department, Augusta, 1884; aged 75; died, March 28, of arteriosclerosis and cerebral hemorrhage.

Oscar W. Brandon, Pima, Ariz.; Central College of Physicians and Surgeons, Indianapolis, 1896; member of the Arizona State Medical Association; aged 63; died, February 26.

James Henry Lancashire, New York; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1883; died, March 6, in St. Augustine, Fla.

Horace Landes Kulp, Philadelphia; Hahnemann Medical College and Hospital of Philadelphia, 1895; aged 64; died, March 22, of cerebral hemorrhage and hypertension.

George Carroll Smith, Boston; University of the City of New York Medical Department, 1881; member of the Massachusetts Medical Society; aged 82; died, February 8.

Nicholas Ignacio Ramos ✠ Newark, N. J.; Baltimore University School of Medicine, 1890; aged 67; died, March 20, in the City Hospital, of hypertensive heart disease.

Gaetano Rescigno, Utica, N. Y.; Regia Università di Napoli. Facoltà di Medicina e Chirurgia, Italy, 1904; served during the World War; aged 57; died, March 11.

Mary A. Keller Hendrickson, Loup City, Neb.; College of Physicians and Surgeons, Keokuk, Iowa, 1890; died, March 26, of cerebral hemorrhage and general debility.

Samuel Levin Benson, Fresno, Calif.; University of Maryland School of Medicine, Baltimore, 1883; formerly health officer of Barstow; aged 79; died, February 28.

Nellie Louise Lawrence, Boston; Woman's Medical College of Pennsylvania, Philadelphia, 1896; aged 73; died, March 4, of cerebral hemorrhage and arteriosclerosis.

Frederick A. Kohn ✠ Chicago; Rush Medical College, Chicago, 1904; aged 52; died, March 31, in St. Anthony's Hospital, of mercurial poisoning, self-administered.

Junius Ambrose Rawlings ✠ El Paso, Texas; University of Louisville (Ky.) Medical Department, 1889; aged 70; died, March 23, of influenza and bronchopneumonia.

William J. Quigley ✠ Lakewood, Ohio; Cleveland Homeopathic Medical College, 1903; member of the staff of St. John's Hospital, Cleveland; aged 56; died, March 8.

Charles Abbott Blake, West Brookfield, Mass.; Dartmouth Medical School, Hanover, N. H., 1885; aged 84; died, February 17, of arteriosclerosis and glaucoma.

Frederick William Main, Detroit; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1884; aged 74; died, March 13, of pulmonary edema.

William Sinclair Davidson, Newland, N. C.; University of Maryland School of Medicine, Baltimore, 1887; aged 76; died, March 23, of carcinoma of the face.

Charles Bell, Washington, D. C.; Georgetown University School of Medicine, Washington, 1902; aged 58; died, February 27, of heart disease and chronic nephritis.

Ernest Lincoln Averell, Akron, Ohio; Baltimore Medical College, 1898; member of the Ohio State Medical Association; aged 69; died, March 10, of myocarditis.

Forest Odessa Phillips Fleener, New Sharon, Iowa; Hahnemann Medical College and Hospital, Chicago, 1910; aged 54; died, March 13, of diabetes mellitus.

John A. Hilbert, Wilkes-Barre, Pa.; College of Physicians and Surgeons, Baltimore, 1907; aged 59; died, March 22, of chronic myocarditis and arteriosclerosis.

Edward W. Jardine, Alma, Wis.; Keokuk (Ia.) Medical College, College of Physicians and Surgeons, 1906; aged 71; died, March 30, of cardiorenal disease.

William Ross Brothers, Duncannon, Pa.; Jefferson Medical College of Philadelphia, 1892; aged 67; died, March 1, of cerebral hemorrhage and myocarditis.

William S. Nesbitt, Dayton, Ind.; Kentucky School of Medicine, Louisville, 1887; formerly county coroner; aged 79; died, March 4, of chronic myocarditis.

John Ralston Sudler, Hockessin, Del.; Maryland Medical College, Baltimore, 1905; aged 46; died, March 6, in the Homeopathic Hospital, Wilmington.

Nathan Wallace Abbott, Cincinnati; Miami Medical College, Cincinnati, 1879; aged 82; died, March 29, of hypertrophic prostatitis and urinary obstruction.

Claudius Pugh Hutchison, Purcellville, Va.; Georgetown University School of Medicine, Washington, D. C., 1899; aged 60; died, March 5, of pneumonia.

Byron Heston Ovenshire, Bay City, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1879; aged 87; died, February 11.

Charles Cushing Jackson, Yeatesville, N. C.; College of Physicians and Surgeons, Baltimore, 1893; aged 70; died, March 29, of carcinoma of the stomach.

Aleri Rogers Graham, Petaluma, Calif.; Rush Medical College, Chicago, 1881; aged 81; died, February 1, of chronic myocarditis and multiple neuritis.

William Henry Lee, New Castle, Pa.; Hahnemann Medical College and Hospital, Chicago, 1886; aged 73; died, March 17, of pleurisy and chronic nephritis.

John Hedlund, Pasadena, Calif.; University of Minnesota College of Homeopathic Medicine and Surgery, Minneapolis, 1893; aged 77; died, March 15.

Emanuel J. Lupin ✠ Philadelphia; Medico-Chirurgical College of Philadelphia, 1896; aged 73; died, March 10, of tuberculosis and arteriosclerosis.

John Louis Chewett Cronyn, Buffalo; University of Buffalo School of Medicine, 1876; aged 82; died, March 26, of myocarditis and arteriosclerosis.

Frank Pyott, Tiptop, Va.; Vanderbilt University School of Medicine, Nashville, 1898; aged 60; was found dead in bed, February 9, of angina pectoris.

John Knox Polk, Lexington, Ky.; Howard University College of Medicine, Washington, D. C., 1913; aged 52; died, March 12, in Lakeland, Fla.

Hermann Frederick Erben, San Francisco; Medizinische Fakultät der Universität Wien, Austria, 1926; aged 38; died, March 2, in Calcutta, India.

David Frank Kline, Philadelphia; Jefferson Medical College of Philadelphia, 1888; aged 72; died, March 13, of pyelonephritis and myocarditis.

Donald Armand Betz ✠ Omaha; University of Nebraska College of Medicine, Omaha, 1931; aged 29; died, March 25, in Bellevue, of pneumonia.

Mary MacMillan ✠ New York; Cornell University Medical College, New York, 1902; aged 72; died, March 18, of fracture of the hip and pneumonia.

Thomas Joseph Grant O'Mara ✠ New York; University of the City of New York Medical Department, 1895; aged 63; died suddenly, March 14.

John Benjamin Matthew, Blue Mound, Ill.; American Medical College, St. Louis, 1875; aged 85; died suddenly, February 16, of endocarditis.

James Rhodes Hudson, Alexandria, Tenn.; Vanderbilt University School of Medicine, Nashville, 1889; aged 76; died, March 1, of myocarditis.

H. W. Orr, Dublin, Ga.; University of the South Medical Department, Sewanee, Tenn., 1900; aged 75; died, February 14, of cerebral hemorrhage.

Gustav F. Boucsein, Baltimore; University of Maryland School of Medicine, Baltimore, 1885; aged 75; died, March 27, of chronic myocarditis.

Herbert Bowen Maxwell, Garden Bay, B. C., Canada; M.R.C.S., England, L.R.C.P., England, 1906; aged 58; died in February, in England.

Frank Pierce Pratt, Seattle; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1883; aged 76; died, February 13.

Rockwell B. Hubbard, Sandusky, Ohio; Eclectic Medical Institute, Cincinnati, 1884; aged 80; died, February 10, of cerebral hemorrhage.

Erle Leslie Biggs, Starke, Fla.; Atlanta Medical College, 1914; aged 44; died, March 22, in St. Luke's Hospital, Jacksonville, of pneumonia.

Curtis Thomas Hayden, Charleston, W. Va.; Howard University College of Medicine, Washington, D. C., 1912; aged 51; died, March 12.

Ezra S. Harroun, Lyons, Ohio; Physio-Medical Institute, Cincinnati, 1884; formerly president of the school board; aged 83; died, March 5.

Louis James Gordon, Edwardsville, Ill.; St. Louis College of Physicians and Surgeons, 1899; aged 61; died, February 20, of myocarditis.

Pierette Croisette, Velpen, Ind.; American Medical College, St. Louis, 1897; aged 81; died, March 5, of influenza and bronchopneumonia.

Joseph W. Duguid, Dover, N. C.; University of Maryland School of Medicine, Baltimore, 1893; aged 64; died, March 28, of angina pectoris.

Harry B. Faulder, Wapakoneta, Ohio; Cleveland Homeopathic Medical College, 1901; aged 69; died, February 13, of cerebral embolism.

Alfred Joseph Conwell, Vineland, N. J.; Jefferson Medical College of Philadelphia, 1880; aged 80; died, March 11, of paralysis agitans.

Ida Florence Barnes, Beverly, Mass.; Boston University School of Medicine, 1893; aged 80; died, March 26, of carcinoma of the stomach.

Everett E. Phillips, Oklahoma City; Kentucky School of Medicine, Louisville, 1878; aged 80; died, March 20, in the City Hospital.

Dorman Elroy Elbridge Haley, Peoria, Ill.; National Medical University, Chicago, 1904; aged 56; died, March 21, of septicemia.

Joseph David Vertin, Phoenix, Ariz.; Loyola University School of Medicine, Chicago, 1916; aged 49; was found dead, February 24.

William Chisolm Lucas, Los Angeles; Denver College of Physicians and Surgeons, 1908; aged 49; died, March 16, in Tampa, Fla.

Charles L. Moeller, East St. Louis, Ill.; Missouri Medical College, St. Louis, 1887; aged 72; died, February 29, of cerebral hemorrhage.

Benzion Kaufman, Brooklyn; Long Island College Hospital, Brooklyn, 1902; aged 65; died, March 17, of coronary thrombosis.

Seth Gordon Hastings, San Antonio, Texas; Pulte Medical College, Cincinnati, 1877; aged 96; died, March 24, of hypostatic pneumonia.

Albert Ernest Forbes, Moncton, N. B., Canada; Halifax Medical College, Halifax, N. S., Canada, 1900; aged 59; died, March 17.

John Leonard Reynolds, Ozark, Ala.; University of Alabama School of Medicine, University, 1907; aged 65; died, March 23.

Germain Laperriere, Levis, Que., Canada; Laval University Faculty of Medicine, Quebec, Que., Canada, 1935; aged 29; died, March 3.

Thomas A. Hightower, Jacksonville, Fla.; University of Nashville (Tenn.) Medical Department, 1873; aged 85; died, March 9.

August Andreas Klein, Boston; Boston University School of Medicine, 1882; aged 88; died, February 20, of arteriosclerosis.

Wilson H. Reed, Omaha; Keokuk (Ia.) Medical College, 1898; aged 64; died, March 7, of influenza and acute endocarditis.

Sidney White Rivenburg ✠ Clifford, Pa.; Baltimore Medical College, 1894; aged 78; died, March 25, of pernicious anemia.

Fred Leffinwill Hinman, Los Angeles; Rush Medical College, Chicago, 1887; aged 75; died, February 1, of paralysis agitans.

Joachim Guinane, Toronto, Ont., Canada; University of Toronto Faculty of Medicine, 1887; died, March 12, of pneumonia.

John Cooper, Pittsburgh; Hahnemann Medical College of Philadelphia, 1879; aged 81; died, March 21, of cerebral hemorrhage.

Arvid Pihlblad, Lindsborg, Kan.; Rush Medical College, Chicago, 1899; aged 61; died, March 7, of cerebral hemorrhage.

Philip Gustav Dill, Baltimore; University of Maryland School of Medicine, Baltimore, 1885; aged 73; died, March 4.

L. Lee MacPhee, Boston; Tufts College Medical School, Boston, 1916; aged 47; died, March 13, in Cambridge.

Emily C. Peterson, Baltimore; Baltimore Medical College, 1883; aged 75; died, March 3, of bronchopneumonia.

Morris William Beder, New York; Long Island College Hospital, Brooklyn, 1910; aged 49; died, March 8.

William Enoch Pollett, Hickory Ridge, Ark. (licensed in Arkansas in 1903); aged 76; died, February 28.

Tupper Kirby, Los Angeles; Iowa Medical College, Des Moines, 1884; aged 81; died, March 6.

T. J. Garner, Washington, Ark.; Atlanta Medical College, 1884; aged 76; died, March 13.

Bureau of Investigation

HEALTH REMEDY PRODUCTS

"Health Anti-Tobacco" and "Health Anti-Liquor" Fraud Debarred from the Mails

From Kansas City, Mo., the Health Remedy Products exploited its mail-order tobacco and liquor "cures." The so-called "anti-alcoholic treatment" was typical of the age-old "can-be-given-secretly-at-home" buncombe, and the "new, easy and quick" tobacco "cure" was a fit companion. Fortunately, this duo of deceptions enjoyed a brief if profitable existence.

Initiated in 1933, it came to an abrupt demise in March 1936 on the declaration of the Postmaster General that the promoter, one G. S. Muchemore, had led the public to anticipate far more than the United States postal authorities deemed credible.

The Postmaster General has stated officially that the Health Remedy Products, G. S. Muchemore, Secretary, and their officers and agents as such, were engaged in conducting a scheme for obtaining money through the mails by means of false and fraudulent pretenses, representations and promises. In view of this, the postmaster at Kansas City, Mo., was instructed to mark "Fraudulent" and return to the senders all letters addressed to the Health Remedy Products and to refuse to pay any postal money orders to the concern.

The Health Remedy Products was conducted by the aforementioned Muchemore, sole owner, with the assistance of one female employe. Victims were secured by means of advertisements (of the we-want-to-help-you type) printed in numerous newspapers and periodicals. Typical advertisements of the tobacco and liquor nostrums read:

QUIT WHISKEY

The Health Remedy Products of Kansas City is now offering a NEW scientifically prepared treatment to aid men and women banish all **FREE** desire for drinking. Thousands have already proved success of this New Easy Way. Can be given secretly. Write today for Free Booklet. Accept no substitutes. Write.

Health Remedy Products 2453 Manufacturers Exch. Bldg. KANSAS CITY, MO.

QUIT TOBACCO

The Health Remedy Products of Kansas City is now offering a NEW scientifically prepared treatment to aid men and women banish quickly all **FREE** desire for smoking, chewing or snuff. Thousands have already proved success of this New Easy Way. Write today for Free Booklet. Accept no substitutes. Write HEALTH REMEDY PRODUCTS, Dept. 548, Manufacturers Exch. Bldg., Kansas City, Mo.

The inquirer who succumbed to the lure of a Quit-Tobacco or Quit-Liquor advertisement received a lengthy printed form-letter. The liquor "come-on" letter read in part:

> "Your letter of inquiry about the Health Anti-Liquor treatment has been received.
>
> "It is a pleasure for me to write to one who is sincere in wanting to quit the drink habit, or is trying to help someone else who has not the will power to try and do this themselves, and I want to do what I can to help you by telling you about the wonderful easy way to take Health Anti-Liquor treatment which so many people say has helped them quickly leave off from all desire of drinking . . ."

Although the promoter inferentially implies in his letter to the prospective victim that he had been a liberal imbiber of alcohol until saved by the "new and easy mixture," he confessed to the post office inspector who investigated the case that he had never taken the "treatment." The letter further stated that "drunkenness is a monster that steals both health and money"; it might well have truthfully added that the Health Remedy Products was equally proficient in achieving a similar result. The Anti-Liquor circular declared its treatment to have been discovered many years ago by an old German physician (the name of this eminent person was not given). Somehow it is usually an Indian chief or an old German physician!

Wives, mothers and sweethearts were assured that the "cure" could be administered secretly. The Bureau of Investigation, in similar exposés, has repeatedly called attention to the fact that there is no drug or combination of drugs known that may be administered either secretly or with the patient's knowledge that will "cure" the desire for alcohol. The principal causative factors in the urge for alcohol are psychic. All methods toward rehabilitation are doomed to failure unless the mental conflicts are removed which bring about the desire to escape from reality by means of the alcoholic "spree." There is no sovereign remedy that will supply will power where none exists.

Front cover of a Health Remedy Products circular (greatly reduced).

If the prospective victim seemed reluctant to part with his money for the "reliable and scientific" old German discovery, Mr. Muchemore became so perturbed that he sent form-letter number two. In this epistle the exploiter expressed a righteous indignation that his desire to aid suffering humanity had failed to meet with a prompt remittance. "I felt sure," he scolds, "that you were serious in wanting to free someone from one of the most terrible curses in the world today, and I only hope that you have *not weakened* [italics ours] from this thought."

To make doubly sure that the victim did not weaken, the trap was cunningly baited with the usual "patent medicine" money-back guarantee. To the unsuspecting the proposition sounded extremely honest and straightforward. All the unfortunate prospect had to do was to take the medicine as directed and then give the "treatment" time to work. If the same old urge to drink returned, all that was necessary was simply to write the Health Remedy Products' office and the money would immediately be returned in full. Just how long an interval Mr. Muchemore felt should be allowed for the treatment to work was not stated; people who claimed they had tried the "Health Anti-Tobacco Treatment" without securing the promised results, failed to get their money back after requesting the promoter to refund it.

While Mr. Muchemore claimed that the Health Remedy Products' Anti-Liquor Treatment was a "new, reliable and scientific method" of treating drunkenness, the post office authorities stated that, according to chemical analysis, the stuff consisted of the "acorns of white oak, roasted, ground and combined with about twenty per cent alcohol by volume," and that the principal therapeutic agent of this preparation was nothing more than tannin from the acorns.

Whether the same "doctors and chemists" who were so eager to aid men and women to quit the liquor habit had another spasm of scientific altruism and compounded the anti-tobacco nostrum, the advertising matter does not state. However, chemical analysis, according to the postal authorities' report, disclosed this "new scientifically prepared treatment" to be "composed essentially of lobelia, nux vomica, gypsum, milk sugar, capsicum, ipecac, powdered elm bark, licorice and corn starch." They left out the "kitchen stove"!

These worthless nostrums, stripped of their advertising falsifications, stand convicted as more heartless demonstrations of the iniquity of the "patent medicine" business, whose callous indifference to truth has caused untold suffering among people who can ill afford such treachery.

Correspondence

BRADYCARDIA WITH HYPOGLYCEMIA

To the Editor:—Ormond (THE JOURNAL, May 16, p. 1726) says he has not been able to find reports of the occurrence of bradycardia with hypoglycemia.

Manfred Sakel has reported many such observations in the course of his insulin shock treatment of schizophrenia. His publications are a valuable source of data on the clinical manifestations of hypoglycemia. In his monograph "Neue Behandlungsmethode der Schizophrenie," for example (Vienna, Verlag von Moritz Perles, 1935) he states (p. 9) that "a very marked bradycardia sometimes reaching thirty-four beats a minute is characteristic of uncomplicated progressive hypoglycemia." But where there is a strong compensatory epinephrine reaction, or convulsions, he correctly observes, the cardiac response is different.

JOSEPH WORTIS, M.D., New York.

POTENCY OF ANTIANEMIC PREPARATIONS

To the Editor:—The editorial on the potency of antianemic preparations in THE JOURNAL, April 11, prompts me to comment on the obvious inadequacy of the method for determining the quantitative potency of liver substitutes prescribed by the Council on Pharmacy and Chemistry.

Determination of the potency of such substances, as specified by the Council, is to be made on the basis of the magnitude of the reticulocyte response induced by the administration of the liver substitute. Although such a response has been used as an indication of qualitative potency of liver and substitutes for it since the introduction of liver therapy, it has been almost uniformly recognized that the magnitude of this response is not necessarily a measure of the power of a substance to produce erythrocytes, which is the fundamental problem concerned in the treatment of pernicious anemia. Not only will certain substances not effective in stimulating erythrocytes produce a reticulocyte increase, but it has been adequately demonstrated that a maximum or satisfactory reticulocyte response may be induced quite as well by such a small amount of liver substance that only a subminimal erythrocyte increase will be induced as by means of a much greater amount of potent substance which will produce an optimal erythrocyte increase.

Sufficient data are now available in both our own and foreign literature based on initial erythyrocyte responses to liver therapy administered in various ways, and on maintenance requirements, so that the efficacy of the liver substitutes may be readily and relatively accurately evaluated on a quantitative basis. In fact, published data indicate that both here and abroad evaluations of potency have been made not alone on the basis of the magnitude of the reticulocyte rise but on the basis of the initial erythrocyte increases, usually during a period of one month, and/or the maintenance requirements in all but one large clinic.

The editorial in one place makes the following comment: "The foregoing illustrates the confusion that is possible in estimating comparative antianemic potencies and emphasizes the necessity for standards such as the Council on Pharmacy and Chemistry has devised." Had the Council initiated standards for determining "comparative antianemic potencies" based on evaluation of the efficacy of substitutes for liver to produce erythrocytes and to maintain them at a normal level instead of resorting to a method open to all sorts of variation and interpretation, the problem of evaluating the efficiency of one particular extract would not have assumed the almost colossal proportions which it has.

It is hoped that the committee on revision of the Pharmacopeia will benefit from the experience of the Council and that the evaluation of the various liver substitutes for inclusion in the new edition may be made on the basis of their effect on erythrocyte production and maintenance.

WILLIAM P. MURPHY, M.D., Boston.

INCIDENCE OF CESAREAN SECTION

To the Editor:—In a paper on the training of medical students in obstetrics (THE JOURNAL, April 25, p. 1435) I inadvertently committed an error in comparing the incidence of cesarean section in American with foreign institutions. It was stated that the incidence at the Boston Lying-In Hospital was 1 to 12 and at the Jefferson Hospital in Philadelphia 1 to 6 during the period 1929-1930. Dr. Frederick C. Irving, visiting obstetrician to the Boston Lying-In Hospital, and Dr. P. Brooke Bland, attending obstetrician to the Jefferson Medical College Hospital of Philadelphia, have each protested the correctness of my statements. Dr. Irving informs me that the incidence of cesarean section at his institution was 1 in 32.7 in 1929 and 1 in 27.5 in 1930, while Dr. Bland states that during the period from 1925 to 1935 the percentage has been 1.6, or less than one in fifty deliveries. While I regret any offense or injustice that might be attributed to my statements, may I state that my figures were obtained from the Report on Maternal Mortality in New York City, 1930-1932, made and published by the New York Academy of Medicine. I find on further investigation that tabulations on the incidence of cesarean section in the United States, from which the Academy Report figures evidently were derived, appeared in the following articles: Davidson, A. H.: *Irish J. M. Sc.*, December 1931, pp. 642-654. Miller, C. J.: *Surg., Gynec. & Obst.* **48**:745 (June) 1929. Gellhorn: *Progressive Medicine* **3**:93 (Sept.) 1930.

Following the receipt of the protests I made an effort to locate the original sources of the statistics noted in Dr. C. Jeff Miller's paper but was unable to do so. In a letter subsequently published in *Surgery, Gynecology and Obstetrics* (**50**: 512 [Feb.] 1930) in which he acknowledges the error, Dr. Miller states that he quoted from a source which he had every reason to believe accurate and reliable.

Evidently an error has been committed by the publication of statistics from the two hospitals in question which are palpably false and I regret very much having become involved in their further dissemination. However, I have been led to a further search and find that, unfortunately, there are other centers of obstetric activity in this country from which equally high cesarean incidences were reported. I will refrain, however, from any further discussion of this subject at the present time and merely desire to reaffirm my regret for having included the two hospitals referred to in the contention expressed in my paper; namely, that the incidence and consequent mortality associated with cesarean section is much too high in this as compared with other countries.

GEORGE W. KOSMAK, M.D., New York.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

DIAGNOSIS IN DISORDER OF NERVOUS SYSTEM

To the Editor:—A woman, aged 53, highly nervous, complained of inability to move either foot and loss of sensation in same. I saw the patient March 14, two days after the onset of the complaint. The previous history was essentially negative, except that she had a scare the day before the onset of the complaint. Physical examination showed both feet dropped, and inability to flex the feet or ankles or to move the toes. The muscles in the calves of both legs were apparently flaccid. There was no sensation to pin pricks on the lateral aspect of both feet; sensation was intact above the ankles and on the medial aspects of the feet. Sensitivity of the soles of the feet could not accurately be determined because of callus. Deep muscle and joint temperature sensation was intact in all areas. Patellar reflexes were slightly diminished but equal. Babinski and Gordon reflexes and ankle clonus could not be elicited. The heart was fibrillating. The blood pressure was 250 systolic, 120 diastolic. Blood analysis showed: hemoglobin 55 per cent; red blood cells 3,100,000. The red cells were well formed, with no poikilocytosis or anisocytosis. The sugar content was 0.201. Analysis of the urine revealed 1.4 per cent sugar. Since she was first seen the patient has regained movement and sensation in the right foot. There is slight improvement in sensation of the left foot and the patient claims that she can feel slight muscle movement in the left foot, but this is not apparent to the examiner. For the past few days she has complained of numbness and tingling of both feet and of the left hand. The blood pressure has fluctuated between 260 and 220 systolic with diastolic at 120. Any suggestion in diagnosis and therapeutics in this case would be greatly appreciated. Please omit name. M.D., Long Island.

ANSWER.—While the onset of a paralysis in a nervous patient following fright and the failure of changes to group themselves in typical fashion suggest hysteria, the impression is one of organic disability. Ordinarily in hysteria, if anesthesia accompanies paralysis, the two generally cover the same area.

The rapid onset is suggestive of a vascular basis, and with a fibrillating heart the possibility of multiple embolisms exists. Should this be responsible, one would expect a change in the color and temperature of the affected extremities and interference with the pulsation of the dorsalis pedis and posterior tibial arteries and possibly of the left ulnar and radial arteries. When sensory changes accompany such an infarctive paralysis they are usually more of the stocking and glove type than was observed here, and there is usually a considerable element of pain. In a case of a few hours' duration, papaverine, through relaxation of the collateral circulation, is of benefit, but it is not helpful at a later stage.

A peripheral neuritis would hardly make its appearance so abruptly, and the sensory changes are hardly in keeping with the muscular involvement. Was the Achilles tendon reflex absent?

A lesion of the spinal cord in the segments subserving the distribution of the fourth lumbar to the second sacral nerve, as judged by the paralysis, or of the first sacral, as judged by the disturbance in sensation, is also suggested. With the changes noted the disorder would suggest a radicular involvement, which also is not in keeping with the sudden onset. A lesion within the cord itself, such as a hemorrhage, which is not a common occurrence, could be the cause, but the hamstring muscles, the gluteus maximus and medicus, and the rotators of the thighs would probably be involved as well. A larger lesion would interrupt the function of the lower part of a cord. A perianal area of sensory disturbance easily escapes detection, but the sphincters were presumably intact. Examination of the spinal fluid may be helpful, should the development of the case be in keeping with such a possibility. In this event the paresthesias in the left arm would remain unexplained.

An unlikely possibility is a bilateral cerebral lesion at the tops of the rolandic fissures. In these cases the disorder is usually on the venous side of the circulation; jacksonian attacks are usually present, and Babinski's sign is usually positive.

The hypertension and the increased blood sugar would seem to have laid the foundation of the disorder but are hardly immediately responsible. These should be treated with due care and as far as it is possible. Heat applied to the extremities would be a safe recommendation, it being borne in mind that a sensory disturbance exists and that care must be exercised to prevent a burn.

SPINAL FLUID IN SYPHILIS

To the Editor:—What is the proper interpretation of a spinal fluid examination in regard to syphilis? Please discuss: 1. Cell count. 2. Globulin. 3. Colloidal Gold. 4. Pressure. How should these findings be evaluated? Please omit name. M.D., Pennsylvania.

ANSWER.—1. Normally there are from 3 to 7 cells per cubic millimeter. A moderate increase in cells, from 10 to 100, with the lymphocytes predominating is found in all forms of neurosyphilis. An increase in cells to 1,000 with lymphocytes predominating is also found in acute syphilitic meningitis.

2. Normally cerebrospinal fluid contains from 15 to 45 mg. of protein per hundred cubic centimeters of fluid. This amount gives a negative test for globulin as usually made. This protein consists mostly of albumin with a small amount of globulin. In most conditions, protein and cell increase go together. Occasionally one may increase more than the other, giving dissociated values. A slight increase in globulin, at 1 + reaction, is found in neurosyphilis. A moderate increase in globulin, a 2 + reaction, may occur in dementia paralytica. A great increase in globulin, 3 + or 4 + reaction, is found in spinal or cerebrospinal meningitis, especially of the syphilitic and epidemic types.

3. Normal cerebrospinal fluid does not precipitate any of the colloidal gold. A strong reaction in low dilutions is known as a paretic curve and is characterized by a 5554321000 curve, but may be weaker. It may be present in dementia paralytica, secondary syphilis, meningovascular syphilis, tabes dorsalis, multiple sclerosis and brain tumor. A strong reaction in medium dilutions is known as the tabetic or luetic curve and is characterized by a 0244310000 curve. It occurs most often in tabes dorsalis, meningovascular syphilis and poliomyelitis. A strong action in high dilutions is known as a meningeal curve and is characterized by a 0011222333 to a 0000245530 curve. It is found in practically all the acute meningitides.

4. The normal cerebrospinal fluid pressure is from 100 to 150 mm. of water when the patient is lying on the side, and from 200 to 300 mm. of water when the patient is sitting up. The pressure is increased in cerebral syphilis. Clear fluid is obtained in central nervous system syphilis. Occasionally xanthochromic fluid is also obtained in meningovascular syphilis.

INDUSTRIAL DISEASE

To the Editor:—A man of 48, who has always been strong and wiry, complains of a gradual increasing weakness of a year's duration. He also has a sensation of epigastric fulness and weakness, especially with exertion. He has nausea frequently in the morning, yet he never vomits. These symptoms do not seem to be connected with meal time or food in any way. A precordial oppression is often associated with the epigastric fulness, yet this has been relieved considerably with belladonna. There is no constipation and the stools have been unformed for a year. At times he has noted undigested food particles in the stools. He is losing weight gradually and his appetite has vanished. Although he was said to have pulmonary tuberculosis fifteen years ago, there have been no pulmonary symptoms in years. Physical examinations have been repeatedly negative. The heart and lungs and the possibility of a neurosis have been ruled out clinically to my satisfaction. Laboratory examinations have given results within normal limits. The white blood cells number 7,300, red blood cells, 4,700,000, hemoglobin 75 per cent. The urine is normal. The stools are negative for parasites, yet they show undigested meat particles. Gastric analysis falls within normal limits. Sputum examination and the Kahn test are negative. The man works for a gas company and throughout the day he must go down into excavations and weld gas pipes with an acetylene torch. He uses no mask. Could the latter fact have any bearing on this case? Kindly omit name.

M.D., Florida.

ANSWER.—It is a safe rule in medicine regularly to be suspicious of the unusual. Applying this rule to the present instance, there probably are many more causes of this condition unrelated to work than to the contrary. There are, however, a few possibilities, and these are now mentioned. In carrying out welding work in excavations or enclosed areas, the hazards are greater than would obtain in open air conditions. Various metal fumes are created, together with the possibility of carbon monoxide gas. Remotely there is a possibility of the formation of sulfureted hydrogen or arseniureted hydrogen, due to impurities in the acetylene gas. This possibility is less now than in earlier years, as the result of more highly purified acetylene. The typical action of the gases and fumes produced by welding is on the respiratory tract. Severe pulmonary edema is possible and pulmonary hemorrhages probably may arise. Pneumonia among welders occurs at a higher rate than for workers in general. Gastro-intestinal disorders as the exclusive manifestation of the action of welding gases and fumes and in the absence of involvement of the respiratory tract would be unusual. In the case of welding on galvanized metals, gastro-intestinal disturbances are common and may arise in the absence of associated involvement of the respiratory tract. In metal fume fever

and zinc chills arising from exposure to zinc fumes, loss of appetite and nausea are almost constant manifestations among others. The precordial oppression mentioned in the query may be of significance and the gastric disturbance may stand in relation to a cardiac condition. It is reasonably well established that the gaseous products of welding may exert an unfavorable action on the heart. It is the intent of this discussion merely to point out that there may be certain possible connections between this patient's condition and his employment. But no warrant exists for a definite stand that the condition described may with certainty be laid to welding work as its primary cause.

DESQUAMATION IN MILD SCARLET FEVER

To the Editor:—Is there any other disease besides measles, scarlet fever and exfoliative dermatitis that is characterized by exfoliation? There was an epidemic here all summer of what some of us think is a mild scarlet fever, while others are calling it a streptococcic sore throat with a rash and exfoliation. Most of the patients were not sick enough to go to bed. The disease is characterized by a rather mild sore throat with slight redness or the typical blood red throat of scarlet fever, with a rather light rash of the abdomen of punctate type. Sometimes there is merely an edema of the skin with some erythema. Some patients have sore tongues and some have complained of soreness of the skin of the palms. Most of the patients have been ill for from four to five days with recovery and in a week or so there has been an exfoliation of the palms of the hands and tips of the fingers. The disease is more contagious than typical scarlet fever, often running through an entire family, but in no instance has an albuminuria followed. Most of the cases are not as severe as an attack of tonsillitis. Scarlet fever serum has been used twice and in one case gave a good result and in another case gave a questionable result. There have been one or two cases out of perhaps forty in which there was otitis media. Kindly omit name.

M.D., Nevada.

ANSWER.—German measles is sometimes followed by a fine branny desquamation. However, the desquamation of German measles is not observed on the palmar or plantar surfaces. Certain drugs, notably arsenic, may also produce either a mild or severe desquamation. Foods may act similarly in allergic individuals.

From the description it seems almost certain that the disease referred to is mild scarlet fever. It might further confirm the correspondent's opinion in this respect if Dick tests were made on all patients following their recovery. A very high percentage of negative Dick tests would be strongly suggestive that immunity had resulted from an attack of scarlet fever.

INJECTION TREATMENT OF HEMORRHOIDS AND HYDROCELE

To the Editor:—Is sodium morrhuate 5 per cent a satisfactory drug to use in the injection treatment of internal hemorrhoids? What advantage has quinine and urea hydrochloride over sodium morrhuate or vice versa? How much time should elapse before an internal hemorrhoid can be reinjected? Can satisfactory results be obtained by the injection of sodium morrhuate or other drugs into a hydrocele of the tunica vaginalis testis and, if so, please outline the technic. Please omit name and post office address.

M.D., Virginia.

ANSWER.—A 5 per cent solution of sodium morrhuate is satisfactory for the injection of internal hemorrhoids in the absence of infection, fissures and fistulas. Occasionally a dilation of the sphincter may be necessary. Quinine and urea hydrochloride are more apt to produce necrosis. Patients sensitive to quinine may develop dangerous, occasionally fatal, reactions. Five per cent phenol in vegetable oil is favored by a great many proctologists. Much more important than the selection of the sclerosing solution is the proper selection of the suitable case, which requires a thorough understanding and recognition of the pathologic processes in the rectum. Injections may be made once or twice a week, depending on the reaction following injections.

The treatment of hydrocele by injections of sodium morrhuate is started by washing out the sac first with sterile physiologic solution of sodium chloride followed by the injection of from 4 to 5 cc. of the drug. To tap the sac the skin must be carefully sterilized with a suitable antiseptic. A dermal wheal is then produced with 1 per cent procaine hydrochloride and a spinal puncture needle is used to tap the sac. The fluid should be completely removed, care being taken that the needle still remains free in the cavity and is not caught in the wall of the sac.

Before deciding on the injection treatment of a hydrocele, gonorrheal, tuberculous or nongonorrheal epididymitis and a tumor of the testicle must be excluded. Such lesions may become palpable after the sac has been tapped. One must also make certain that there is no communication with the peritoneal cavity such as occurs in the congenital type of hydrocele and that there is no associated inguinal hernia. The latter may become irreducible if the hydrocele is obliterated.

HEADACHES AND MENSTRUATION

To the Editor:—Mrs. W., aged 26, never pregnant, was never seriously ill in the past. She had a tonsillectomy and adenoidectomy in 1931 and an appendectomy in 1932. During her convalescence she developed a cystitis and pyelitis following catheterization. This condition lasted about five weeks and cleared up. She had two slight recurrences of the same malady but each time it cleared up quickly. Menstruation began when she was 14, the flow being markedly irregular until the time of her marriage, three and one-half years ago. At all times the flow is very scanty, stringy and mucous; the last four months witnessed an exceedingly scant flow, lasting not even twenty-four hours. The menses are painless. While in training to be a nurse she had a dilation and curettage and was given some "injections" with the hope that her flow might become more profuse and more regular; nothing was accomplished, however, beyond establishing a somewhat more regular flow. The patient had "terrific" reactions following the injections, and the latter had to be abandoned. During the appendectomy the patient's pelvic organs were examined and found normal (apparently). The family history is negative save for the fact that her mother had what doctors considered "migraine" headaches. The patient is a native of one of the Southern states and her headaches (the chief complaint) started with her coming east three and a half years ago. The following is her description of the headaches and what goes with it: "The headaches are severe, peculiar; irregular as to time of appearance, there being no particular cause that would start them. The headache begins at the root of the nose, spreads to the malar bones, and many times there is a sensation of 'pinching' in the back of the neck. The neck feels 'stiff' and is never relaxed. The pain then travels to the shoulders and to the spinal column halfway down. There is no nausea. There is a sensation as if the eyes 'pop' out of the orbits, and there is a constant desire to draw the head backward. There is a throbbing in the temples, and for more than a year with the headaches there was been a sharp, needle-like 'shooting' in any part of the body. This 'shooting' is of very short duration; it 'darts' through the part and ceases. These headaches leave me in a very weak condition and are followed by marked perspiration of the palms of the hands and the axillae." The patient lost 10 pounds within a year. She is very nervous and irritable and oftentimes is depressed. Her reflexes are exaggerated. The blood pressure is 112 systolic and diastolic. The eyegrounds are normal. The sinuses are normal. The blood picture is normal. The ninety skin tests for possible allergy were negative. There is no postnasal discharge. The last urine examination showed a specific gravity of 1.030, marked acidity, albumin, pus cells, many epithelial cells, many casts and many finely granular casts. Fehling's solution turns yellowish green on standing. Roentgen examination shows apparent osteomatous change in the right posterior ethmoid cell and unerupted, impacted third molar teeth. The teeth were extracted with no relief. The roentgen examination according to the eye, ear and nose man do not account for the headaches. The Wassermann test is negative. All urine examinations until the last were usually negative, but the specific gravity kept creeping upward; it started with 1.005 in 1932 and went up to 1.030 in 1935. Physical examination is negative save for the fact that of late the patient feels a dull pain along the path of the right ureter. Pressure over the shoulders, the back of the neck and along the sternocleidomastoid muscle reveals distinct pain. The physicians who have treated the patient are inclined to believe that there is a hysterical basis underlying the condition that accounts for all these symptoms. It is my belief, however, that there is apparently some organic lesion (not omitting the hysteria part), perhaps a hypofunctioning gland or glands, perhaps the ovary, as one may deduce from the menstrual history of the patient. I would greatly appreciate your kindness if you would give me your opinion regarding this case and, if possible, an outline for some course of treatment. Kindly omit name.

M.D., Connecticut.

ANSWER.—The patient's own minutely detailed description of the character of her headaches would seem to lend some support to the suspicion that a hysterical element may exist, and yet there are other features of the case that call for investigation. No mention is made of the frequency of the headaches, but presumably their occurrence is not limited to any part of the menstrual cycle. It is unlikely that the hypomenorrhea, which is the only menstrual symptom, is a causative factor, though it should be of interest to make studies of the urinary hormone excretion, if this is practicable. The headaches do not suggest migraine, which is often preceded by an increased output of follicle stimulating factor. If other studies, to be mentioned, do not throw light on the problem, it would be permissible to try, experimentally at least, the hypodermic use of an estrogenic preparation, preferably one of the oily solutions. A dosage of about 2,500 international units two or three times a week could be tried throughout one cycle at least.

A rather significant statement is that the headaches date from about the time of a sharp postoperative pyelitis and cystitis, and that the urine still shows pus and albumin, as well as casts. Furthermore, the patient now suffers with "dull pain along the path of the right ureter." Certainly a thorough urologic examination would seem in order, including pyelography. It is quite possible that the headaches may be of toxic nature and that the focus of infection may be a renal one, with possibly a stricture of the ureter. In such cases dilation of the stricture should relieve the pain along the ureter and may also help the headache and other symptoms. Other possible foci seem to have been adequately considered.

HYPERTHYROIDISM

To the Editor:—Twelve years ago I treated a patient, aged 42, for enlargement of the thyroid gland with mild tachycardia and slight nervousness. She was then in the menopausal state. The enlargement disappeared and she seemed improved and then discontinued medication. Three weeks ago she consulted me for tachycardia (150), nervous tremor, loss of weight and exophthalmos. She has no appreciable enlargement of the thyroid; in fact, I believe that the gland has almost disappeared. She is anemic, weighs 102½ pounds (46.5 Kg.) and has 70 per cent hemoglobin. The urine is normal. My diagnosis is hyperthyroidism. The blood pressure on the first visit was 158/90, the second 152/70, the third 150/71, and the fourth 144/70. The pulse rate now is 108. The heart sounds are good; there are no murmurs and no irregularities. Digitalis, instead of raising the blood pressure, appears to be lowering it. I am prescribing along with digitalis some bromides and belladonna. The patient feels better but I do not know why she should show symptoms of hyperthyroidism with hardly any thyroid gland and why the blood pressure should fall steadily under medication that usually raises the blood pressure. It is possible that she was "kidding herself" in a false sense of good health during the intervening twelve years, but the thyroid is practically gone. I do not believe there is anything surgical in this case now. Have you any suggestions to make? I believe I have a case of toxic hyperthyroidism that is going to be very unsatisfactory to treat. Please omit name.

M.D., New York.

ANSWER.—In exophthalmic goiter the average weight of the thyroid gland corresponds to the intensity of the hyperthyroidism. The ratio of the average basal rate to the average weight of the gland in grams is approximately one to one. While these averages are true, extreme variations take place.

In the majority of cases of exophthalmic goiter, enlargement of the thyroid gland is evident on palpation, if not on inspection. In a small percentage of cases the thyroid gland, even though enlarged, is not palpable. The portion of the thyroid gland remaining after thyroidectomy is palpable in the majortiy of cases of recurrence of hyperthyroidism. In a small percentage of cases it is not, and in rather rare instances the surgeon has difficulty in finding any remnant of the thyroid gland at the time of the secondary exploration. In most instances, even if there is only a small remnant, its removal satisfactorily drops the metabolic rate and relieves the patient.

ERUPTIONS IN LUMBER WORKERS

To the Editor:—In recent years since the virgin yellow pine timber has been exhausted in this section of the country, sawmills have been cutting second growth or sappy pine and, in order to prevent it mildewing or turning blue, various chemicals are being used as a dip for the lumber to preserve its natural color. October 24 I saw a patient who has come in contact daily with lumber so treated and his body gets damp with this solution. As a result his arms, legs and body have broken out in a raised eruption, from the size of a small shot to larger than a split buckshot; most of these places develop a pustule at the crest or peak. The solution being used in this case, I am told, is called Dowicide, and I believe it is made in New Orleans but I am not sure. I thought possibly that you might know what chemicals are in this solution and what may be the injurious element and the treatment for the condition. Please omit name.

M.D., Mississippi.

ANSWER.—"Dowicides" represent a series of chlorinated phenolates. "Dowicide-H" is sodium tetrachlorophenoxide. These substances are believed to be made by the Dow Chemical Company of Midland, Mich., but in the South are distributed and serviced by the Chemical Treatment Company, Incorporated, in New Orleans. A large number of other substances are, or have been, used as fungicides, such as mercury bichloride, potassium dichromate, creosotes, pine oil, arsenic compounds, sodium carbonate, calcium hypochlorite, carbonyl sulfide, ethylmercuric chloride and ethylmercuric phosphate. Many of these substances constitute distinct skin irritants and bring about a true occupational dermatitis when exposure is provided. Chapman, in "Chemical Control of Sap Stain in the South" (*Southern Lumberman* **149**:82 [Dec. 15] 1934) says:

> One difficulty which has been encountered with the chlorphenolate treatments when used in hand-dipping vats has been the matter of irritation. A certain proportion of workmen who continually dip their hands in such solutions have been found to be susceptible to this irritation, which appears as a rash on the hands and forearms. Its occurrence is confined to mills using hand-dipping vats; workmen handling freshly dipped lumber at mills where automatic vats are used are very rarely troubled with it. For those who are bothered with this irritation, the prior application to the hands and forearms of ordinary engine oil or grease has been found very helpful. Experimental work with materials which could be added to the compound to prevent or greatly reduce such irritating effect is now under way, and it seems likely that further trouble from this source will soon be eliminated.

The skin lesion specified in this query undoubtedly is a result of exposure to Dowicide, although lack of personal cleanliness may have been a contributory factor, and a secondary entry of pyogenic bacteria or fungi may have complicated the original dermatitis venenata. Preferable to applications of "engine oil or grease" is a protective coating made up of 75 per cent hydrous wool fat, 24.5 per cent olive oil and 0.5 per cent phenol. This preparation becomes rancid in time and containers require servicing. Although animal and vegetable fats are superior to mineral oils, white petrolatum containing 10 per cent camphor may be used. In the absence of sustained exposure, almost any bland treatment will eradicate this dermatitis, provided it is uncomplicated by a mycotic dermatitis. To soak with aluminum acetate or potassium permanganate is efficacious. Ten per cent zinc oxide in olive oil is useful, particularly after the acute state has passed. If complicated by the action of fungi, much more elaborate treatment may be required, including such medicaments as Whitfield's ointment, solutions of crystal violet dye or certain mercurials. Under any circumstances patients should avoid the use of harsh soaps, and particularly should eschew clean-up methods that include gasoline, benzene, naphtha or other hydrocarbons.

VITAMIN B IN ANEMIA

To the Editor:—My reading on the subject of the administration in true pernicious anemia of vitamin B in the form of yeast leaves me with the impression that this source of vitamin B requires being acted on by normal gastric juice. Is this impression correct? If so, such treatment would be impracticable in routine practice. If yeast is used for its vitamin B, what may be regarded as a necessary daily amount? Are tablets of from 6 to 7½ grains (0.4 to 0.5 Gm.) satisfactory? If Embo (General Mills, Inc.) is used for its vitamin B, what is the necessary daily amount to be effective, and may benefit be expected in the absence of a normal gastric juice, an achylia? Please omit name.

M.D., California.

ANSWER.—The work of Castle and others has shown that yeast acted on by normal gastric juice is effective in bringing about a remission in pernicious anemia. Vitamin B, given in the form of yeast, is usually prescribed at the present time because of its general effect rather than for any specific effect on the lesions of pernicious anemia.

It may be given either as powder or as tablets, and it is customary to prescribe a level teaspoonful two or three times a day in the form of powder, or its equivalent in tablets. If Embo is given, the dosage is two or three teaspoonfuls each day.

The only benefit that could be expected would be from the general effect of giving these substances rather than from any specific effect on pernicious anemia. It is common practice to give both brewers' yeast and cod liver oil as adjuncts in the management of pernicious anemia. However, there are no scientific data to show that patients with pernicious anemia who are receiving adequate potent material (liver, stomach) get a better result when on a diet containing large amounts of these substances than when on just a well balanced diet.

FOOD AND COLOR OF URINE

To the Editor:—Can the ingestion of a considerable quantity of cooked beets or of tomato juice cause a red or pinkish color to the urine? I have consulted the large textbooks of Simon and of Webster on clinical laboratory methods, also the works of Todd and Sanford, of Russell Haden and of Kolmer and Boerner without finding any definite statement regarding this seemingly insignificant point. A woman brought me a specimen of urine from her little boy that was definitely pinkish, apparently from eating cooked beets. No chemical or microscopic evidence of blood was present and no albumin, and the child was perfectly well. Any references to the literature will be appreciated.

M.D., Nevada.

ANSWER.—The color of normal urine is yellowish or amber, but the tints even in health may vary considerably. The reaction also has an influence on the color, and highly acid urine frequently becomes darker on standing, because of the oxidation of chromogens. The urochrome that gives the yellow color to the urine is at least in part derived from the pigment chlorophyll present in green plants and consumed as foods. Traces of urobilin, present chiefly in the form of the chromogen urobilinogen, hematoporphyrin and uro-erythrin (which gives the deep reddish tinge of urine in acute fevers) are also present.

Many foods and drugs will alter the color of the urine. The urine may become reddish after the eating of beets, and an intense yellow after the ingestion of carrots, owing to the coloring matter of these plants. A dark yellow or reddish brown may be due to rhubarb, cascara, senna, santonin or considerable salicylic acid. Red may be produced by antipyrine, acetanilid, sulfonmethane or sulfonethylmethane. A brownish black may be caused by resorcin, tannin, phenol (carbolic acid), guaiacol, thymol, phenyl salicylate, hematin or melanin. A greenish black is produced by phenyl salicylate or pyrogallol, and a blue or greenish blue by methylene blue. Phenylazo-2-6-diaminopyridine monohydrochloride, fuchsin and aminopyrine may cause a red orange. Bile pigments color the urine reddish

brown, brown or greenish and give to it a greenish yellow foam. Among foods, beets, carrots, tomatoes, rhubarb, and pigments of logwood, madder, bilberries, and fuchsin are the most common causes of abnormal coloration of the urine.

An excellent discussion of the color of the urine under normal and pathologic conditions may be found in "Urinary Analysis and Diagnosis," by Heitzmann, New York, William Wood & Co., 1934.

AZOOSPERMIA

To the Editor:—A man, aged 28, complains of sterility. Seven years ago he contracted gonorrhea. The discharge cleared under local treatment within a few weeks. He is small, 4 feet 5 inches (135 cm.) in height and weighs 128 pounds (58 Kg.). The ears, nose and throat are not abnormal. There is no goiter. The lungs are clear throughout. The heart and abdomen are normal. The reflexes are normal. The prostate is small and contains a few hard nodules. The left seminal vesicle is hard, tortuous and cordlike. The testicles are small and atrophied. The urethra shows a large stricture, admitting a No. 22 French sound with difficulty. Blood Wassermann tests and the Hinton test give negative results. The urine is normal except for one or two pus cells per high power field. The patient's wife has been thoroughly examined and is physically normal. They have been married four years and there have not been any pregnancies. The patient has received a long course of dilations up to 30 French and prostatic massage. A condom specimen on two occasions after this treatment has failed to show any spermatozoa, the seminal fluid being scanty, thin, and full of pus cells and lipoid débris. A diagnosis of chronic vesiculitis, chronic prostatitis and urethral stricture, accompanied by aspermia, seems to prognosticate permanent and absolute sterility. However, the patient requests treatment with glandular extracts in an attempt to produce spermatogenesis. Is there at present any available glandular product of pituitary or orchic origin that will bring about spermatogenesis in atrophic testicles? Moreover, is it likely that any such therapy would render this man fertile or men who have chronic vesiculitis and probably occluded vasa deferentia? Please omit name.

M.D., New Hampshire.

ANSWER.—The cause of the azoospermia (not aspermia as mentioned in the query) may be due to the atrophic condition of the testicle or to occluded vasa or both. No mention is made in the query whether the original gonorrhea was accompanied by epididymitis and also whether the epididymides at present feel thickened, nodular and occluded. It would also be of interest to know whether the testicles were normal in appearance previous to the attack of gonorrhea. The mode of procedure at present would be as follows: The patient should be given 0.3 Gm. (5 grain) tablets of the anterior lobe of pituitary extract, one tablet four times a day for a week. The amount should be increased to two tablets four times a day for another week and again three tablets four times a day for another week and finally four tablets four times a day; that is, sixteen tablets a day, or 5 Gm. (80 grains) of the extract, which should be kept up for at least six months. This has frequently brought back the spermatogenic function of the testicles. If at the end of six months the condom still shows azoospermia, the condition may be due to occluded vasa and the differential diagnosis can be made by aspiration of the testicle after the method of Huhner (Aspiration of the Testicles in the Diagnosis and Prognosis of Sterility, *J. Urol.* **19**:31 [Jan.] 1928). If no spermatozoa are found, the condition may be considered almost hopeless and certainly treatments should be discontinued. If, however, spermatozoa, even though few and inactive, are found, the operation of epididymovasostomy may be recommended, the patient being informed that the operation is only at times successful and that without operation there is absolutely no hope and then leaving it to him to decide.

DELAYED PUBERTY IN GIRL

To the Editor:—A Negress has not as yet begun to menstruate and also has not the least sign of a mammary gland development. These glands look just like the male glands. She feels healthy and is normal in weight and height for her age. The pubic hair is typically distributed. There is no hair on the face and no thyroid gland enlargement. The basal metabolic rate has not been determined. The blood pressure and heart rate are normal. Could you suggest a treatment that might be of some value in the case? She is 17 years of age. Please omit name.

M.D., North Carolina.

ANSWER.—It would be helpful in answering this query if one could know whether the basal metabolic rate, blood count and urine are normal. Assuming that they are, the girl should be given one of the gonadotropic preparations derived from the urine of pregnancy or from the placenta. Any of these is apt to be effective. This treatment should be continued, if necessary, for several months. She should also be given small doses of thyroid, beginning with 0.016 Gm. three times a day and increasing by 0.016 Gm. every fifth day until the dosage is reached that produces a slight tachycardia, tremor or nervousness.

INCOMPATIBILITY IN PRESCRIPTION

To the Editor:—On June 10, 1935, the following prescription of mine was compounded:

Codeine	gr. ½
Amidopyrine	gr. 5
Acetylsalicylic acid	gr. 10

Put in capsule No. 12. One P. R. N.

The patient has taken these pills without any ill effect, but on August 28 she took one and within two hours became extremely ill with epigastric pains, persistent vomiting, headache, weakness and dizziness. Investigation showed that the material in the capsules had melted and had become yellowish. Will you inform me as to whether or not there can be any chemical reaction between the substances in the prescription with the formation of toxic material? Please omit name.

M.D., Connecticut.

ANSWER.—In the presence of moisture there does occur a chemical change by reaction of amidopyrine and acetylsalicylic acid, the first step in which seems to be the liberation of acetic acid and a liquefaction of the ingredients. This might be accounted for by a splitting of acetylsalicylic acid into its two component radicals under the influence of moisture. There is no doubt that further changes occur, as the material on standing becomes yellowish and ultimately even dark brown. The exact nature of this ultimate product still remains to be determined. One can understand however that, even in the first stages of decomposition of the acetylsalicylic acid, both the acetic acid and the salicylic acid would be capable of producing irritation such as was noted. It may be of interest that the addition of starch to the powder before encapsulation is capable of preventing this decomposition.

USE OF TYPHOID VACCINE IN ARTHRITIS

To the Editor:—Relative to the article on page 1161 in THE JOURNAL of Oct. 5, 1935, regarding the treatment of arthritis, the statement was made that very good results have been obtained in the past from typhoid vaccine. Would you kindly advise whether it was Wright's vaccine that was used, the dosage, and the interval between doses?

G. M. MCCLURE, M.D., Fisher, Ill.

ANSWER.—The vaccine originally employed was an ordinary typhoid vaccine prepared by Wright's method. There is no objection, however, to using the so-called "Triple Typhoid Vaccine," each cubic centimeter of which contains B. typhosus, 1 billion organisms; B. paratyphosus A, 750 million organisms; B. paratyphosus B, 750 million organisms. The vaccine is killed by heat and preserved with 0.5 per cent tricresol.

When typhoid vaccine is to be used therapeutically, it is more convenient to dilute it 1 to 10 with salt solution. The first dose for adults is usually 25 millon (though some recommend 50 million) injected directly into the vein. The chill and fever appear from thirty to forty-five minutes after the injection. In order to obtain good reactions, it is necessary to increase the dose after each injection. In fact, some writers recommend doubling the dose after each injection.

The interval between injections should be from three to six days.

The maximum benefit is usually obtained by from five to six injections. The patient should then have a rest of several weeks before the treatment is repeated.

USE OF ARTIFICIAL LIGHT IN VISUAL TESTS

To the Editor:—Please tell me why you advise testing visual acuity under artificial light, especially of such low illumination intensity as 7 to 10 foot candles.

HILMAR G. MARTIN, M.D., Milwaukee.

ANSWER.—In order to standardize as far as possible any subjective test, all possible variables must be of such known quantity and character as to permit of reproduction when desired. In the measurement of visual acuity, one of the greatest variables is the quantity of illumination. If daylight is utilized, the intensity of illumination may vary from only a few foot candles to as high as many thousand, depending on the time of day, the locality, the clearness of the sky and the atmosphere and innumerable other factors, all of which are beyond control. Consequently it is far better to use artificial illumination of known intensity, which can be reproduced at any time of the day or night in any locality as desired. It is well known that visual acuity increases only slightly with an increase in intensity of illumination beyond 9 foot candles, when the reflection factor of the background is around 80 per cent, as is the case with the test cards used in measuring visual acuity; on the other hand, the increase from zero to 9 foot candles is accompanied by an enormous increase in visual acuity (Seeing, by Luckiesh and Moss, 1931). Consequently, nothing is to be gained by using more than 10 foot candles except complication of illuminating apparatus and increased expense.

INSERTION OF SUTURES BEFORE LACERATION IN CHILDBIRTH

To the Editor:—Does medical literature describe the placing of perineal sutures during the early part of the second stage of labor, such sutures to be tied after delivery in the event of there having been a laceration or to be withdrawn if no laceration occurs? I have been following this practice for a number of years in my obstetric cases with success in obtaining normal and exact approximation of the soft parts when lacerated during delivery.

A. B. BOWER, M.D., Armada, Mich.

ANSWER.—About fifty years ago, E. Lapthorn Smith of Canada wrote about a method of putting stitches in the perineum before the baby was born, which stitches afterward were tied, bringing the torn structures together. On this recommendation it was done at the Cook County Hospital by several generations of interns but was found inadequate, because the muscle tears deeply at the sides, from the periosteum of the pubic rami and behind the rectum at the raphe which joins the two pillars of the levator ani, anterior to the coccyx.

DeLee has placed stitches in the perineum before doing episiotomy at the Chicago Lying-in Hospital for many years, but few have imitated this example, nor is there reference to this procedure in the literature.

DIATHERMY AFTER FRACTURES

To the Editor:—1. Of what value is diathermy following fractures, especially subcapital fractures of the femur? 2. Does such treatment predispose to fibrous union? 3. If fibrous union should be occurring would it aid or diminish the process of bone deposition? 4. What is the optimum, maximum and minimum dosage of administration of diathermy for hip fractures (if it is indicated)? 5. Does the use or nonuse of diathermy alter the outlook in event the patient sues because of nonunion? Please omit name.

M.D., Kansas.

ANSWER.—1. Although increasing blood supply might increase bone union, this is controversial.

2. No.

3. It would be of doubtful aid.

4. We do not believe that it is indicated, but when used the dose varies with the type of apparatus, size of electrodes, and bulk of the tissue treated.

5. No.

NO RELATIONSHIP BETWEEN AMEBIC DYSENTERY AND DIABETES

To the Editor:—I have been consulted by a patient, a war veteran who saw service in France during the World War and who there contracted amebic dysentery, for which he was treated together with amebic abscesses of the liver, which resulted as a complication of the dysentery. Sometime after his war service he was found to have diabetes mellitus of a moderately severe grade, which has persisted up to the present time. 1. Is the amebic dysentery with the liver abscesses a causative factor in producing the diabetes? 2. Is there a possibility of direct invasion of the pancreas with amebas, resulting in pancreatic disease and diabetes? Please omit name.

M.D., Ohio.

ANSWER.—1. There is no evidence whatever that amebic dysentery complicated with liver abscess is a causative factor in producing diabetes.

2. There is no authentic report of invasion of the pancreas by Endamoeba histolytica. Such invasion is extremely unlikely and can be demonstrated only by authoritative postmortem examination.

In the case noted there would seem to be no reason for suspecting an etiologic relationship between amebiasis and the diabetes. Diabetes in amebiasis is apparently no more frequent than in other groups.

ANGINA PECTORIS IN LOCOMOTIVE ENGINEER

To the Editor:—What can I do as a safety measure in a case of angina pectoris in a locomotive engineer? In order to be within the law one must be careful, yet one should be able to protect the public also.

M.D., Washington.

ANSWER.—No patient who has angina pectoris should ever, under any circumstances, drive a locomotive or engage in any occupation where his sudden incapacity would endanger himself or others. This applies equally well to any other possible source of sudden incapacity. His occupation demands his constant attention every moment. Even a slight attack of pain might divert his attention at a critical moment. A more serious hazard lies in the possibility of a coronary thrombosis while at work. Any person who has angina pectoris is much more liable to have a coronary thrombosis than one without such symptoms and in all probability will eventually die of such an attack. He should report his condition to the examining physician of the railroad at once.

Medical Examinations and Licensure

COMING EXAMINATIONS

STATE AND TERRITORIAL BOARDS

ALASKA: Juneau, Sept. 1. Sec., Dr. W. W. Council, Juneau.

ALABAMA: Montgomery, June 23-25. Sec., Dr. J. N. Baker, 519 Dexter Ave., Montgomery.

ARIZONA: *Basic Science.* Tucson, June 16. Sec., Dr. Robert L. Nugent, Science Hall, University of Arizona, Tucson. *Medical.* Phoenix, July 7-8. Sec., Dr. J. H. Patterson, 826 Security Bldg., Phoenix.

CALIFORNIA: San Francisco, July 6-9, and Los Angeles, July 20-23. Sec., Dr. Charles B. Pinkham, 420 State Office Bldg., Sacramento.

COLORADO: Denver, July 7. Sec., Dr. Harvey W. Snyder, 422 State Office Bldg., Denver.

CONNECTICUT: *Medical (Regular).* Hartford, July 14-15. *Endorsement.* Hartford, July 28. Sec., Dr. Thomas P. Murdock, 147 W. Main St., Meriden. *Medical (Homeopathic).* Derby, July 14. Sec., Dr. Joseph H. Evans, 1488 Chapel St., New Haven.

DELAWARE: July 14-16. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, Dover.

DISTRICT OF COLUMBIA: Washington, July 13-14. Sec., Commission on Licensure, Dr. George C. Ruhland, 203 District Bldg., Washington.

FLORIDA: Jacksonville, June 15-16. Sec., Dr. William M. Rowlett, P. O. Box 786, Tampa.

HAWAII: Honolulu, July 13-16. Sec., Dr. James A. Morgan, 48 Alexander Young Bldg., Honolulu.

IDAHO: Boise, Oct. 6. Commissioner of Law Enforcement, Hon. Emmitt Pfost, 205 State House, Boise.

ILLINOIS: Chicago, June 23-26. Superintendent of Registration, Department of Registration and Education, Mr. Homer J. Byrd, Springfield.

INDIANA: Indianapolis, June 23-25. Sec., Board of Medical Registration and Examination, Dr. William R. Davidson, Room 5 State House Annex, Indianapolis.

IOWA: *Basic Science.* Des Moines, July 14. Sec., Prof. Edward A. Benbrook, Iowa State College, Ames.

KANSAS: Topeka, June 16-17. Sec., Board of Medical Registration and Examination, Dr. C. H. Ewing, 609 Broadway, Larned.

MAINE: Augusta, July 7-8. Sec., Board of Registration of Medicine, Dr. Adam P. Leighton, 192 State St., Portland.

MARYLAND: *Medical (Regular).* Baltimore, June 16. Sec., Dr. John T. O'Mara, 1215 Cathedral St., Baltimore. *Medical (Homeopathic).* Baltimore, June 9-10. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MASSACHUSETTS: Boston, July 14-16. Sec., Board of Registration in Medicine, Dr. Stephen Rushmore, 413-F State House, Boston.

MINNESOTA: Minneapolis, June 16-18. Sec., Dr. Julian F. Du Bois, 350 St. Peter St., St. Paul.

MISSISSIPPI: Jackson, June 22-23. Sec., State Board of Health, Dr. Felix J. Underwood, Jackson.

MONTANA: Helena, Oct. 6. Sec., Dr. S. A. Cooney, 7 W. 6th Ave., Helena.

NEW HAMPSHIRE: Concord, Sept. 10-11. Sec., Board of Registration in Medicine, Dr. Charles Duncan, State House, Concord.

NEW JERSEY: Trenton, June 16-17. Sec., Dr. Arthur W. Belting, 28 W. State St., Trenton.

NEW MEXICO: Santa Fe, Oct. 12-13. Sec., Dr. Le Grand Ward, Santa Fe.

NEW YORK: Albany, Buffalo, New York, and Syracuse, June 22-25. Chief, Professional Examinations Bureau, Mr. Herbert J. Hamilton, 315 Education Bldg., Albany.

NORTH CAROLINA: Raleigh, June 15. Sec., Dr. Ben J. Lawrence, 503 Professional Bldg., Raleigh.

NORTH DAKOTA: Grand Forks, July 7-10. Sec., Dr. G. M. Williamson, 4½ S. 3d St., Grand Forks.

OHIO: Columbus, June 16-19. Sec., State Medical Board, Dr. H. M. Platter, 21 W. Broad St., Columbus.

OREGON: *Medical.* Portland, June 16-18. Sec., Dr. Joseph F. Wood, 509 Selling Bldg., Portland. *Basic Science.* Corvallis, July 18. Sec., Mr. Charles D. Byrne, University of Oregon, Eugene.

PENNSYLVANIA: Philadelphia and Pittsburgh, July 7-11. Sec., Board of Medical Education and Licensure, Mr. Clarence E. Ackley, 400 Education Bldg., Harrisburg.

PUERTO RICO: San Juan, Sept. 1. Sec., Dr. O. Costa Mandry, Box 536, San Juan.

RHODE ISLAND: Providence, July 2-3. Chief, Division of Examiners, Mr. Robert D. Wholey, 366 State Office Bldg., Providence.

SOUTH CAROLINA: Columbia, June 23. Sec., Dr. A. Earle Boozer, 505 Saluda Ave., Columbia.

SOUTH DAKOTA: Rapid City, July 21-22. Dir., Division of Medical Licensure, Dr. Park B. Jenkins, Pierre.

TEXAS: Austin, June 23-25. Sec., Dr. T. J. Crowe, 918-19-20 Mercantile Bldg., Dallas.

UTAH: Salt Lake City, July 10. Dir., Department of Registration, Mr. S. W. Golding, 326 State Capitol Bldg., Salt Lake City.

VERMONT: Burlington, June 24. Sec., Board of Medical Registration, Dr. W. Scott Nay, Underhill.

VIRGINIA: Richmond, June 18-20. Sec., Dr. J. W. Preston, 28½ Franklin Rd., Roanoke.

WASHINGTON: *Basic Science.* Seattle, July 9-10. *Medical.* Seattle, July 13-15. Dir., Department of Licenses, Mr. Harry C. Huse, Olympia.

WEST VIRGINIA: Bluefield, July 13. State Health Commissioner, Dr. Arthur E. McClue, Charleston.

WISCONSIN: Milwaukee, June 30-July 3. Sec., Dr. Robert E. Flynn, 401 Main St., La Crosse.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS. *Parts I and II.* June 22-24 and Sept. 14-16. Ex. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

SPECIAL BOARDS

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: Written examination and review of case histories of Group B candidates will be held in various cities in the United States and Canada, Nov. 7. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh (6).

AMERICAN BOARD OF OPHTHALMOLOGY: New York, Sept. 26. *All applications and case reports must be filed sixty days before date of examination.* Address, 122 So. Michigan Ave., Chicago.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: Cleveland, Jan. 9. Sec., Dr. Fremont A. Chandler, 180 N. Michigan Ave., Chicago.

AMERICAN BOARD OF OTOLARYNGOLOGY: New York, Sept. 25-26. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha.

AMERICAN BOARD OF PEDIATRICS: Baltimore and Cincinnati in November. Sec., Dr. C. A. Aldrich, 723 Elm St., Winnetka, Ill.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: New York, Dec. 29-30. Sec., Dr. Walter Freeman, 1028 Connecticut Ave., Washington, D. C.

AMERICAN BOARD OF RADIOLOGY: Cleveland, Sept. 25-27. Sec., Dr. Byrl R. Kirklin, Mayo Clinic, Rochester, Minn.

California Reciprocity and Endorsement Report

Dr. Charles B. Pinkham, secretary, California State Board of Medical Examiners, reports 17 physicians licensed by reciprocity and 5 physicians licensed by endorsement from Jan. 2 through Jan. 30, 1936. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
College of Medical Evangelists		(1934)	Maryland
University of Colorado School of Medicine		(1933)	Colorado
Northwestern University Medical School		(1932), (1934)	Illinois
University of Illinois College of Medicine		(1934)	Illinois
University Medical College of Kansas City, Missouri		(1904)	Oregon
University of Nebraska College of Medicine		(1921) (1905), (1926), (1934)	N. Dakota, Nebraska
Columbia Univ. College of Physicians and Surgeons		(1926)	New York
New York University, University and Bellevue Hospital Medical College		(1906)	Washington, (1924) New York
University of Oklahoma School of Medicine		(1930)	Oklahoma
Meharry Medical College		(1933)	New York
University of Manitoba Faculty of Medicine		(1924)	N. Dakota
Queen's University Faculty of Medicine		(1924)	Michigan

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Leland Stanford Junior University School of Medicine		(1917)	U. S. Navy
University of Illinois College of Medicine		(1930)	U. S. Navy
Albany Medical College		(1929)	N. B. M. Ex.
Columbia Univ. Col. of Physicians and Surgeons		(1924)	N. B. M. Ex.
University of Oregon Medical School		(1931)	N. B. M. Ex.

Wisconsin January Examination

Dr. Robert E. Flynn, secretary, Wisconsin State Board of Medical Examiners, reports the oral, written and practical examination held in Madison, Jan. 14-16, 1936. The examination covered 19 subjects and included 100 questions. An average of 75 per cent was required to pass. Fifteen candidates were examined, all of whom passed. Twenty-four physicians were licensed by reciprocity and 1 physician was licensed by endorsement. The following schools were represented:

School	PASSED	Year Grad.	Number Passed
College of Medical Evangelists		(1935)*	1
Loyola University School of Medicine		(1936)	1
Northwestern University Medical School		(1935),* (1935)	2
Rush Medical College		(1934), (1935)	2
Univ. of Minnesota Medical School		(1931), (1934), (1935)	3
University of Wisconsin Medical School		(1934, 4), (1935)	5
Schlesische-Friedrich-Wilhelms-Universität Medizinische Fakultät, Breslau		(1920)†	1

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Yale University School of Medicine		(1930)	Connecticut
Loyola University School of Medicine		(1931)	Illinois
Northwestern Univ. Medical School		(1930) Illinois, (1932)	Minnesota
Rush Medical College		(1928), (1934)	Illinois
University of Illinois College of Medicine		(1932), (1933)	Illinois
State University of Iowa College of Medicine		(1922), (1927)	Iowa
University of Kansas School of Medicine		(1928)	Kansas
University of Michigan Medical School		(1930), (1931)*	Michigan
University of Minnesota Medical School		(1931), (1932), (1935),* (1935)	Minnesota
Washington University School of Medicine		(1929), (1930)	Missouri
University of Pennsylvania School of Medicine		(1929)	Mass.
Marquette Univ. School of Med.		(1933) California, (1934)	Michigan
University of Wisconsin Medical School		(1931),* (1931)	New York

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Northwestern University Medical School		(1916)	U. S. Navy

* License has not been issued.
† Verification of graduation in process.

Nevada Reciprocity Report

Dr. Edward E. Hamer, secretary, Nevada State Board of Medical Examiners, reports 2 physicians licensed by reciprocity after an oral examination held in Carson City, Feb. 3, 1936. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Loyola University School of Medicine		(1935)	California
Milwaukee Medical College		(1906)	Wisconsin

Book Notices

The Diagnosis and Treatment of Pulmonary Tuberculosis: A Handbook for Practitioners; A Text-Book for Students, Nurses and Social Workers. By John B. Hawes, Jr., M.D., President of the Boston Tuberculosis Association, and Moses J. Stone, M.D., Assistant Professor, Diseases of the Chest, Boston University, School of Medicine. With a foreword by Richard C. Cabot, M.D. Cloth. Price, $2.75. Pp. 215, with 44 illustrations. Philadelphia: Lea & Febiger, 1936.

Hawes and Stone have presented a brief historical sketch of tuberculosis in the human family, beginning with references on the Babylonian tablets and ending with the recent developments, such as chest surgery. Brief but adequate chapters on history taking and symptoms are included. In the discussion of the physical examination the minor and insignificant signs, which are often given much space, have been entirely omitted. This is greatly to the advantage of the reader, who will find only the important phases of the physical examination included. It is particularly significant that the authors included a chapter on the differential diagnosis of tuberculosis and other common diseases of the lungs and bronchi. In the chapter on pulmonary tuberculosis in childhood, attention is called to the fact that a positive tuberculin test is necessary for the diagnosis of the childhood type of tuberculosis. The tuberculin test, together with history of exposure and roentgen examination, is carefully considered. As regards treatment, many tuberculosis workers in this country will disagree with statements concerning the value of the preventorium for children with the childhood type of tuberculosis. The roentgen examination is stressed, but its substitution for the clinical examination of the patient is definitely condemned. The fact is emphasized that in the early development of pulmonary tuberculosis the x-rays may fail but that in most cases they give valuable information before one is able to elicit clinical signs and before symptoms are present. It is clear from the descriptions of shadows of tuberculosis and other diseases that one cannot determine the etiology of a pulmonary lesion with accuracy on a single roentgen examination. Emphasis is placed on the importance of repeated sputum examinations when tuberculosis is suspected and tubercle bacilli are not found in the first few examinations. Adequate space and conservative conclusions are drawn regarding the value of the blood sedimentation test and the leukocyte picture. In the chapter on treatment of pulmonary tuberculosis, attention is called to the work of Pratt and Minor, who like many others have accomplished excellent results by treating patients in the home; yet in homes where adequate facilities are not available such treatment should not be attempted. The recognized value of artificial pneumothorax in the treatment of pulmonary tuberculosis is pointed out. Other forms of collapse therapy, such as interruption of the phrenic nerve, intrapleural and extrapleural pneumolysis, and extrapleural thoracoplasty, are considered. In the chapter on heliotherapy, the authors have not expressed undue enthusiasm but look on this form of treatment as only one agent in an attempt to control tuberculous lesions. In no uncertain terms, Hawes and Stone advise against the use of BCG "until many disputed points in regard to it are cleared up and until we have far more definite knowledge as to its possible value and dangers than is at present available." This volume, although small, contains a great deal of valuable information and therefore deserves a place in the library of every physician.

Modification of the Virulence of Tubercle Bacilli. By N. Plum. Särtryck ur Skandinavisk veterinärtidskrift för bakteriologi, patologi samt kött- och mjölkhygien. Paper. Pp. 397-472. Uppsala: Almqvist & Wiksells Boktryckeri-A.-B., 1935.

This monograph (an English translation) details the work carried out in the State Veterinary Serum Laboratory during 1925 to 1930 and contains an extensive review of the literature, with a bibliography of 129 references. The survey forms a continuation of a previous monograph by the author on avian tuberculosis in mammals, in 1925-1926. Twelve charts on experimental data are included. The work has been painstaking in detail and the author admits many possibilities for error in results and interpretation. The problem was to make avian tubercle bacilli virulent for mammals and to make mammalian tubercle bacilli virulent for fowls. The cultural properties of

tubercle bacilli are reviewed and cases recorded in which mammalian tubercle bacilli were demonstrated in birds and avian tubercle bacilli in mammals. Mixtures of bovine and avian tubercle bacilli are inoculated through several generations of guinea-pigs, rabbits and hens, and it was found possible to separate the avian and bovine bacilli in the original mixture by this means, as fowls appear to be able to eliminate bovine bacilli from the mixtures while guinea-pigs eliminate the avian bacilli. These observations show that caution is necessary in judging the results, since the resistance of these experimental animals to the various tubercle bacilli is not absolute. Mammalian tubercle bacilli may live in fowls for a considerable length of time without giving rise to microscopic tuberculous changes, and avian bacilli may show some virulence for guinea-pigs, although this virulence will fail to appear in the next generation of pigs. The inoculation of material from tuberculous organs of fowls into guinea-pigs and rabbits showed that it was not practicable in this way to produce modification of the virulence of the bacilli employed. The inoculation of tuberculous organs of fowls into calves, rabbits, guinea-pigs and fowls showed a modified virulence in two of six series of experiments. The inoculation of tuberculous organs of cattle into guinea-pigs, rabbits and fowls showed a modification of the virulence in four of eleven series of experiments. A bovine culture injected intravenously into fowls and the organs injected into guinea-pigs, rabbits and hens in one experiment showed a modification of virulence of the bacilli. This monograph merits reading by all interested in tuberculosis and particularly by students engrossed in the experimental phases. It points out the difficulties encountered in solving so simple a problem as virulence of tubercle bacilli in the intricate disease tuberculosis. The author's concluding contention that it is actually possible with the technic given to modify the character of virulence in tubercle bacilli will be questioned by those conversant with experimental methods in tuberculosis, yet he is to be given credit for writing an excellent monograph on a difficult subject that still challenges undisputed proof. No doubt this problem will eventually succumb to the exacting weapons of the fundamental investigator now reenforced by the ever enlarging scope of new methods and stimulated by this monograph.

Autistic Gestures: An Experimental Study in Symbolic Movement. By Maurice H. Krout. Psychological Monographs. Edited by Joseph Peterson. Vol. XLVI, No. 4, Whole No. 208. Published for The American Psychological Association. Paper. Price, $1.75. Pp. 126, with 10 illustrations. Princeton, N. J., and Albany, N. Y.: Psychological Review Company, 1935.

The present volume is an interesting monograph. The purpose is to determine whether spontaneous gesticulations or movements are significant as far as aiding in understanding the nature of mental mechanism is concerned. The author particularly wishes to find out whether autistic gestures or unconscious movements are sufficiently concrete so that they can be observed in a scientific manner, to find out whether the stimuli of these gestures can be determined through daydream or reading responses, and whether there is any consistency of gesture in similar stimulus situations. The number of gestures was observed, classified and tabulated. The reliability of the observers in obtaining this material was also checked and correlated. The author concludes that autistic gestures cannot be interpreted even by individuals who conscientiously attempt to interpret them but require an "abstracted state" and special technics for their study; that the gestures are determinable through the stimuli with which they are associated in time and that there seems to be a reproduction of specific autistic gestures to a stimulus. These gestures probably originate in conflict situations of which they become symbolic, and they may be an escape mechanism in the presence of conflict and blockage. The author feels that further study of gestures will reveal information valuable for personality study. His conclusions seem fairly well justified from the material given. A study of this sort is highly specialized, lying between an experimental psychologic point of view and the psychoanalytic. While one can criticize in some detail various weaknesses and see a tendency toward finding desired results where only speculation exists, in this monograph is pointed out a means of personality study that might prove useful in the future. There is appended a list of 340 gestures that were observed. The material has little value except to the most advanced students of psychopathology.

Atlas der klinischen Elektrokardiographie mit Anleitungen zur Differentialdiagnose. Von Dr. Wilhelm Dressler, Assistent der "Herzstation" in Wien. Second edition. Paper. Price, 15 marks. Pp. 116, with 164 illustrations. Berlin & Vienna: Urban & Schwarzenberg, 1936.

The author has made a great improvement in this edition over the first. He has included a number of electrocardiograms, many of them with four leads, illustrating the changes seen in coronary occlusion and myocardial infarction. Thirty new illustrations have been added in the present edition to the 134 in the preceding one and a number of the old curves have been replaced by better ones. The illustrations are nicely reproduced, and the descriptions have been revised in many instances. As before, the electrocardiograms are placed on one page and the descriptions of the curves, the electrocardiographic diagnosis, and the pertinent clinical observations are printed on the opposite page. This permits the reader to arrive at his own interpretations independently if he desires this practice. This book is intended more for the cardiologist versed in the field of electrocardiography than for the beginner in this field. Many rare and involved arrhythmias are presented, which would be more confusing than beneficial to the general practitioner, the medical student or even the majority of internists. They are, however, well suited for the cardiologist wishing to become more expert in his electrocardiographic diagnosis. Naturally, there are a number of interpretations of records with which many authorities would disagree, the most obvious being figure 21. Furthermore, it is difficult to understand how an author so cognizant of the recent advances in electrocardiography can still persist in calling bundle branch block of the common type right bundle branch block. But these are minor criticisms and do not detract from the merits of the book. It is highly recommended for the cardiologist desiring advanced electrocardiography.

Thirty-Third Annual Report, 1934—1935, of the Imperial Cancer Research Fund. Under the Direction of the Royal College of Physicians of London and the Royal College of Surgeons of England. Paper. Pp. 35. London, 1935.

Dr. J. A. Murray, who has been director of the Imperial Cancer Research Fund since 1915, retired Oct. 1, 1935, and Dr. William Ewart Gye, formerly on the staff of the Imperial Cancer Research Fund (1913-1919), who has been working under the Medical Research Council for the past sixteen years, was appointed director. The report of the director cites the pessimism and confusion that prevailed in the medical profession in 1902 on the subject of cancer. Cancer in animals was practically unknown. The morbid anatomists regarded cancer as a cellular disease and, of the many hypotheses to explain its origin, only the Cohnheim theory of embryonic rests has survived as an explanation of certain rare malignant tumors. Hanau's first successful transplantation of a rat tumor to another rat and Morau's repetition of this experiment made little impression. Jensen's experiments made a more profound impression, as the Imperial Cancer Research Fund was just established and was just beginning to demonstrate that cancer was one of the few diseases common to man and all vertebrate animals. Bashford's studies of 10,000 cases critically analyzed revealed that in the accessible sites only 9 per cent had not been recognized clinically, while 7 per cent had been erroneously diagnosed as cancer. In the inaccessible sites the percentage of missed diagnoses was as high as 38, while only 9 per cent of cases had been erroneously diagnosed as cancer. Since cancer in inaccessible sites constitutes a large fraction of the total deaths, the recorded total cancer mortality must be considerably lower than the actual one. Improvements in methods of diagnosis and clinical recognition of cancer would tend to diminish the extent of missed diagnoses and increase the recorded mortality. If this argument is correct the increase in cancer mortality should fall mainly in the inaccessible group and less marked in the accessible. Investigation proved that the alleged increase fell mainly in the inaccessible group, more especially the stomach, while the skin and uterus showed no increase; in fact, the incidence of cancer of the uterus showed a decrease. The alarming statement that

cancer was appearing more frequently in the young was also disproved. These inquiries proved that cancer is not increasing at an alarming rate in civilized communities and that cancer is found when looked for among savage uncivilized people. Two aspects of the problem must be sharply distinguished: first, that which deals with the conversion of a normal cell into a malignant cell; second, that which deals with the properties of the malignant cell itself. Attention is again called to the existence of a group of filtering tumors caused by intracellular agents. The criticism that these are not true neoplasms seems to be wholly untenable. The belief is expressed that the knowledge of the disease gained in the last thirty years is more extensive than that of most other chronic diseases and has profoundly influenced its diagnosis and treatment.

Principles of Hygiene. Part I: Principles of Constructive Hygiene. Part II: Principles of Defensive Hygiene. By Thomas A. Storey, Ph.D., M.D., Director, School of Physical Education and Hygiene, Stanford University. Revised edition. Cloth. Price, $3.50. Pp. 524, with 66 illustrations. Stanford University, California: Stanford University Press, 1935.

This revised edition of Dr. Storey's book is all that a textbook of hygiene for advanced students should be. It is not suitable for beginners but for the advanced student who needs to learn more of hygiene than just the principles useful in everyday living; it is a fine textbook, comprehensive without being heavy, scientific without being abstruse. It is well calculated to give the prospective sanitarian or public health official, or the teacher of health and hygiene, a practical working knowledge based on a sound comprehension of underlying principles. The first half of the book is devoted to principles of constructive hygiene; that is, a discussion of heredity, cellular physiology, nutrition, the structure and function of the body and its relation to the environment. In the second part the author discusses defensive hygiene; that is, the hereditary dangers, nutritional deficiencies, the abnormalities of growth and development and the unfavorable factors in the environment. A second volume, in preparation, is planned to take up the practice of hygiene based on the principles set forth in this book. For the undergraduate medical student or the student working toward a postgraduate degree in health and hygiene, or for the reference library of any college or university where hygiene is taught, this book can be recommended with confidence. It is well illustrated, clearly printed and adequately indexed. In this day of awakening interest in hygiene and public health on the part of his patients, the practicing physician might find it a useful addition to his library, not so much to impart knowledge as to correlate that which he possesses from the point of view of individual and group hygiene.

A Textbook of Surgery. Edited by Frederick Christopher, B.S., M.D., F.A.C.S., Associate Professor of Surgery at Northwestern University Medical School, Chicago. By American Authors. Cloth. Price, $10. Pp. 1,608, with 1,349 illustrations. Philadelphia & London: W. B. Saunders Company, 1936.

This new surgical textbook is a large single volume and is the result of contributions from no less than 184 authors. The author selected in each instance is an authority in his field, a teacher, a master surgeon, a well known clinician or a research worker. The chapters, while brief and of necessity condensed, are informative and authoritative. The text differs from that of the older works in that it is not dogmatic. It is not calculated to create the impression in the student's mind that the information proffered is final; it reads rather like a report on a study in progress. This characteristic, coupled with short historical references and an appended bibliography, lifts it from the level of the all too dogmatic textbooks and places it in a close rapprochement with the current scientific medical literature. The student will receive from it the impression that no knowledge is final but that everything is subject to further investigation. The book reflects the best thought in American surgery. The uniformity in the care of presentation of subject matter, the excellence of its English and the appreciation of pedagogic requirements make this volume a valuable addition to our teaching armamentarium. All the chapters are adequately treated, but especially noteworthy are those on the relationship of bacteriology to surgery by Meleney, diseases of the thyroid gland and their management by Pemberton and Haines, arthritis by Wagoner, the treatment of the autonomic nervous system by White, and the concise and exhaustive chapter on diseases of the liver and biliary system by Judd, Crisp and Waldron. While the book is written primarily for the student, the practicing surgeon will find it most useful for rapid orientation in any given field.

Über die formale Genese des Lungenkrebses. Von Kaj Lindberg. Arbeiten aus dem Pathologischen Institut der Universität Helsingfors (Finland), Neue Folge, Band IX. Heft 1–3. Gegründet von weil. Prof. Dr. E. A. Homén. Herausgegeben von Prof. Dr. Axel Wallgren. Paper. Pp. 400, with 560 illustrations. Jena: Gustav Fischer, 1935.

This monograph is based on a systematic study of the bronchial tree in primary carcinoma of the lung. In a number of cases a tendency to the development of many carcinomatous formations in the bronchial lining was established. A definite change in the bronchial epithelium in one or several places outside the main growth was demonstrated in more than a third of the cases studied. Such changes were found in the flat cell variety of carcinoma; it was not found in adenocarcinoma. The author emphasizes that he found only minute multiple carcinomas in addition to the large carcinoma and no other macroscopically recognizable primary growths with only one exception, in which case each lung was the seat of a primary carcinoma about as large as a fist. It seems as if the possibility must be considered that at least many of the small carcinomas developed long before death but that for some reason they grew slowly, perhaps on account of restraining influences originating from the large carcinoma. But there is also the possibility that the minute carcinomas, in some cases at least, developed shortly before death when the resistance of the body perhaps was broken down. Other phases of carcinoma of the lung, as, for instance, "precancerous" changes, spontaneous tumors of lungs in animals, efforts to produce tumors of the lungs experimentally, and earlier observations on changes in the bronchial epithelium in pulmonary carcinoma, are discussed also. The reports of the cases studied, with profuse illustrations, occupy no less than some 260 pages. There is a good bibliography. The monograph will be of great interest to all students of carcinoma of the lung.

Introduction to Human Parasitology. By Asa C. Chandler, M.S., Ph.D., Professor of Biology, Rice Institute, Houston, Texas. Fifth edition. Cloth. Price, $5. Pp. 661, with 308 illustrations. New York: John Wiley & Sons, Inc.; London: Chapman & Hall, Limited, 1936.

Several features recommend the new edition of Chandler's Human Parasitology: it is as readable as former editions, especially for the nonparasitologist; it brings the subject to date, including in its pages progress in numerous fields during the last six years; it is useful as a ready reference for the physician in supplementing his knowledge concerning the numerous diseases ordinarily confined to the tropics but which appear with alarming frequency in temperate zones. The book is divided in three parts: protozoa, helminthology and arthropods. In the first part items of interest to the physician are syphilis and other spirochetal diseases, amebiasis and malaria; the second part is devoted to the worms, including especially tapeworms, hookworms and their allies, and trichinae; the last part presents methods by which mosquitoes, flies, fleas, ticks and the other arthropods may be recognized, and means for their destruction. The last chapter is devoted to fly maggots and myiasis, with several pages on the subject of myiasis of wounds. There are numerous illustrations scattered throughout the text, while at the end is a list of books and periodicals for the assistance of persons who desire to pursue the subject further.

Doctor of the North Country. By Earl Vinton McComb, M.D. With a preface by Logan Clendening, M.D. Cloth. Price, $2. Pp. 238. New York: Thomas Y. Crowell Company, 1936.

This is a sincere, unvarnished tale of the experiences of a doctor who has grown up with the lumbering country of the upper Michigan peninsula, has seen the lumber go and new times come, and all the way through has cared for and lived with his people. Brought up in the family of a physician, he early learned to admire and respect his father and, through him, the calling which he represented. The book has its laughs and its tears, and often they are close together, just as they are

in life. It has its grim aspects too, and in places the author indulges in mysticism, at which point he comes nearest to spoiling his book. However, as the introduction by Logan Clendening points out, doctor talk is the best talk there is, and this is good doctor talk. If a patient or two could pick it up from the waiting room table and read it while waiting for the doctor, it might help to dispel the state of the public mind to which Robert Morris referred when he characterized gratitude as one of the first symptoms of disease to disappear as convalescence sets in.

Studies in the Psychology of Sex. By Havelock Ellis. In Four Volumes. Cloth. Price, $15, per set. Pp. 3,000. New York: Random House, 1936.

For many years these studies of the psychology of sex have been available only to physicians, sociologists and the legal profession. There is likely still to be some difference of opinion as to whether or not the time is ripe for the release of this material to general readers. However, the new publisher has purchased the plates of the original edition, has combined the original seven volumes into four handsome books in a nice wooden box, and makes the collection available at an exceedingly low price. The books have been enthusiastically greeted by reviewers in all the leading literary publications of the country. Certainly it is well to have these contributions of a great pioneer in this acceptable form. The volumes include such topics as sexual inversion, eonism, homosexuality, marriage and many similar subjects.

Prognose und Therapie der Geisteskrankheiten. Von Privatdozent Dr. Max Müller. Paper. Price, 7.20 marks. Pp. 164. Leipzig: Georg Thieme, 1936.

Müller summarizes the various types of therapy in the psychoses and puts into this little volume a tremendous amount of information. Interestingly, he compares the analytic method of treatment with other methods, calling the former an "uncovering" technic and the latter a "covering" technic, which is an excellent contrast. As a summary of the various methods of treatment, the work is well recommended.

Essentials of Psychopathology. By George W. Henry, Associate Professor of Psychiatry, Cornell University Medical School, New York. Cloth. Price, $4. Pp. 312. Baltimore: William Wood & Company, 1935.

The author has written an elementary book concerned with general psychic mechanisms and their deviations from normal. He has done fairly adequately in his attempt to be fair to most of the important schools in psychiatry. There is a small amount of illustrated case material. Three hundred pages is hardly sufficient for an adequate summary of the field of psychopathology, so that this work serves simply as an appetizer to the beginning student in the field. It is recommended highly for this purpose.

Neurose; Lebensnot; ärztliche Pflicht: Klinische Vorlesungen über Psychotherapie für Ärzte und Studierende. Von Professor J. H. Schultz. Boards. Price, 4 marks. Pp. 125. Leipzig: Georg Thieme, 1936.

Under this queer title the author presents an elementary consideration of the neuroses as a result of certain needs within the patient and thus agrees with etiologic psychiatry. The work is intended more for general practitioners or the public and corresponds in content to the numerous works of a similar character published in England. It has no particular value to the specialist or to the general practitioner.

Neurology and Psychiatry for Nurses. By Frederick P. Moersch, B.S., M.D., Associate Professor of Neurology, The Mayo Foundation, Rochester, Minnesota. Boards. Price, $1.85. Pp. 104, with 9 illustrations. Minneapolis, Minn.: Burgess Publishing Company, 1935.

The author has written a compact manual for nurses in which the essential data concerning nervous and mental diseases are included. There is an adequate reading list that indicates what supplementary work should be consulted. The material is given in a concise form, in fact is a brief outline, and as such may not be well suited for nurses. Its purpose as a means of review for examination could be stated as accomplished. This is not the best of the modern works that are available for nurses.

Miscellany

COUNTY MEDICAL SOCIETY LEADERSHIP IN PUBLIC HEALTH EDUCATION

WILLIAM J. CARRINGTON, M.D.
AND
ROBERT A. KILDUFFE, M.D.
ATLANTIC CITY, N. J.

The public today is health conscious as never before. Unfortunately much of the medical "information" disseminated to assuage public interest is grotesquely garbled and absurdly distorted. This is obvious to any one who tries to escape the bombastic bombardment of the radio, the billboard and the advertising sections of popular magazines, in which a molecule of medical fact becomes a mountain of unscientific balderdash authenticated (!) by innumerable "leading hospitals" and equally innumerable "physicians of prominence" possessing one attribute in common, anonymity.

That public ignorance and credulity should exist to a degree rendering such propaganda possible and profitable is not only regrettable but even, perhaps, astonishing. Doctors have long lamented the fact that otherwise intelligent people in quest of health sometimes, if not indeed, often, follow flickering fads over devious detours before returning, bruised and broken, to the straight and narrow path of reason.

But the same doctors have not always either admitted or lamented the fact that, to no small extent, the fault in this matter lies with physicians rather than with the laymen. Laymen possess a natural and lively thirst for medical knowledge. But physicians, wrapped in a mystic mantle of medieval reserve, have remained taciturn, have refused, except in a minor and often ineffective degree, to use the lay press and the radio, and to that extent have renounced leadership in public health education.

Physicians may well be annoyed at the preposterous misinformation that floods the air and crowds the printed page, and particularly at the subtle and often not so subtle intimation that it is all endorsed by the medical profession. But physicians who skip the page or turn the dial in bored disgust often fail to realize or admit that it is their own indifference or neglect which both cause and perpetuate this evil.

In the face of this indifference, within the past few decades numerous organizations have sprung up with the laudable and lofty purpose of educating the public in medical matters. With the aims of many of these, physicians have been in complete accord and have cooperated as fully, perhaps, as the insistent demands of private practice permit, for medicine is a jealous mistress. But nevertheless it is certain that the medical profession in general has not assumed the full leadership in the education of the public which is properly its place and its function.

To this end the Atlantic County Medical Society has recently departed somewhat from tradition in an endeavor to assume such leadership in its own community, and our purpose in this brief article is to describe what a small but well organized county society can do and is doing to tell its own public what they should know about medicine.

The origin of this action was largely accidental. On Sept. 24, 1935, a nurse was asked to plan a "town health meeting" for Atlantic City and received a publicity kit and guide from Mr. Prantz of the National Health Council. She was offered the services of Mr. Dennis J. Sullivan of the New Jersey State Department of Health. The meeting was to be a part of a nation-wide campaign of education on community health problems and was to be synchronized with hundreds of similar meetings, with nation-wide publicity and coast-to-coast radio programs. In spite of all the proffered lay help, the nurse

did not arrange a town health meeting. But, long after the nation-wide campaign, a minister came upon the unused plans and discussed them with a member of the chamber of commerce. By purest accident they fell into the hands of a physician, who brought them to the attention of the county medical society. The society eagerly seized on the idea and planned and consummated its highly successful town health meeting.

It is not our intent to criticize the National Health Council for failure to solicit the help of the county medical society in planning a campaign concerned with health; for, while this might seem a more proper method than to rely solely on lay individuals and lay organizations, it may well be that experience has taught the National Medical Council the difficulty of expecting effective leadership or even active participation in such matters from local medical societies.

This may seem, perhaps, an unwarranted and severe assumption. But the fact remains that there has been more than a modicum of medical indifference and neglect and, even when this has not been the case, the inability of physicians to express themselves and their views in a manner interesting to the public at large has more than once been commented on by those concerned with the dissemination of such material.

In any event, the town health meeting was held under the auspices of the Atlantic County Medical Society with short and pointed addresses by chosen members of the society on such subjects as Patent Medicines and Quackery, Periodic Health Examinations, Health Agencies, Socialized versus Organized Medicine, and other kindred, timely subjects.

Particular effort was devoted to making the addresses and the meeting interesting and concise, the speakers being enjoined to make their remarks pointed, striking and brief. To ensure this all addresses were edited by a committee chosen for the purpose and the time limit for each speaker was strictly enforced.

The town health meeting proved to be a decided success and produced a stirring revival of community interest in health matters, so much so that the society was prepared to rest on its oars, as it were, satisfied that something had been accomplished. But, fortunately, it was prevented from lapsing into self-satisfied lethargy by a comment from a newspaper editor. The press had been exceedingly generous with space given to the town meeting and very gracious in its favorable comments. But, in discussing the meeting afterward the editor commented: "This is all very well. It was a good idea and a good meeting. But the trouble with you medical men is that you start something, but you do not finish it! What comes next?"

What comes next? What should come next? The society suddenly realized that public interest, after all, is apt to be fitful and transient; that, like a human soul, it has a way of backsliding. It is not a single advertisement but its repetition and reiteration that bring returns. If the profession is to advertise public health and its importance, as it well may and should do, its efforts must not be spasmodic but, on the contrary, consistent and persistent if there are to be any lasting results.

So the Atlantic County Medical Society was confronted with the problem of how to maintain the public interest its town health meeting had aroused. It realized that numerous "health articles" are written by men of exceptional skill with years of experience and syndicated in nearly every newspaper in the country. But their articles lack specific community appeal. Moreover, the finances of a county medical society with only 114 members does not permit the employment of a physician not in practice with the requisite ability to act as a full time publicity agent. The society as a whole, therefore, undertook to sponsor, produce and carry on a series of articles on public matters to be printed once a week in the magazine section of the Atlantic City *Sunday Press* under the caption "Sponsored by the Atlantic County Medical Society."

Two difficulties at once presented themselves: What should be the character of the articles and how could it be ensured that they would have "news interest" and popular appeal?

The committee of four appointed to direct the project drew up, first of all, a tentative list of titles and, after first selecting individuals thought to be best fitted to discuss certain subjects, appealed for volunteers from the society at large to be given assignments from the remaining titles. The appeal was eminently successful.

The selection of subjects for the articles was in large degree governed by several factors:

(*a*) As a community project, it was thought desirable to lay some emphasis on its community aspects; for, without doubt, in any community there are many uninformed as to the degree and character of the facilities and agencies existing in the community in relation to public health. Various articles in the series were concerned, therefore, with the nature and character of the public health facilities of Atlantic City: its hospitals, convalescent homes and sanatoriums, its climatic and other aids in keeping well, and the opportunities for sane and healthful amusement and relaxation available to its residents: for who will deny that it is as important to keep well as to get well? Indeed, is not this the crux of preventive medicine?

(*b*) Admitting the often commented on inability of physicians to speak or write entertainingly of such matters, resulting, perhaps, from lack of practice, the committee reserved the right to reject, amend, edit and return to the author for rewriting when necessary all the papers submitted. Final acceptance or rejection as well as the order of publication was delegated to the editor of the *Press*.

(*c*) Recalling the old proverb that "few souls are saved after the first twenty minutes," an absolute maximum of 1,200 words was established and adhered to. In the endeavor to attract the attention of readers, particular care was given to the title. Thus "Care of the Aged" became "Life Can Begin at Sixty," "Pneumonia" became "The Captain of the Men of Death," and "The Healthy Child" was transformed into "Children of the Sun."

As an aid in arousing and maintaining community interest, and incidentally as an inducement to volunteers, each article appears over the signature of the author. By thus being neither anonymous nor by authors perhaps unknown to the majority of the community, they have a more personal community interest and possibly may thus be more generally read. But, in order to avoid any suggestion of personal advertising, as it were, certain precautions were made mandatory:

First, regardless of whatever titles the author may possess, such as, for example, F.A.C.S., F.A.C.P. or F.A.S.C.P., each article was signed simply as M.D., all other titles or positions, such as staff directorships, being omitted.

Second, all articles were rigidly deleted of personal pronouns and references to personal experiences.

Third, all polysyllabic technicalities were ruthlessly blue-penciled and every effort was made to secure articles not only accurate in detail but simple in expression and, whenever possible, with some intrinsic literary merit. Controversial subjects were tabu.

Finally, while a monotonous and parrot-like motif of "see your doctor" was studiously eliminated, the complete avoidance of any reference to self diagnosis or self treatment carried its own moral.

The Atlantic County Medical Society is using two other means of educating its public in health matters, the radio and accurate newspaper accounts of its scientific meetings. Both have proved quite satisfactory.

Twice a week for a period of fifteen minutes members of the society or distinguished medical visitors broadcast over station WPG. The announcer introduces the doctor by name

and states his subject but omits all titles, degrees or positions. The talks are plain, pointed and helpful, though aids in self diagnosis and self treatment are studiously avoided. The plan has been in operation for some time and has met the approval of lay listeners, the radio station and the profession.

For many years newspaper reporters sat wearily through the meetings of the medical society and wrote accounts for the press which contained an amazing amount of misinformation. For the past two years a member of the society with a nose for news has taken notes and after the meeting has had a press conference, so that the news accounts have been much more accurate, have contained but little misinformation and have been interesting to laymen as well as to the profession.

The public has responded well to the series of medical articles, to the radio talks and to the accounts of the medical meetings. It is true that the plan is young, but it is presented as an illustration of what can be done by any county society, large or small, in any county. It is admitted that to carry it out effectively is not easy; but the profession must recapture leadership in public health education. It can be done and done well if the desire to do it exists.

905 Pacific Avenue.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Optometry: Corporate Practice of Optometry Illegal in Kansas.—The state, on relation of the attorney general, instituted original proceedings in quo warranto in the Supreme Court of Kansas against the defendant jewelry company, to determine whether it was engaged in the practice of optometry and, if so, to oust it from exercising any business as a corporation in the state. The corporation admitted that at the time of the filing of the petition, July 19, 1935, it employed a registered optometrist who made examinations and fitted glasses, and that all fees paid for services rendered by the optometrist were paid to the corporation which in turn paid the optometrist a specified salary. The corporation contended, however, that on the day on which the petition was filed against it, it "voluntarily" changed its method of doing business and rented to one Jacobs, a regularly licensed and practicing optometrist, space in its store and contracted with him to practice his profession in the rented space. As described by the Supreme Court, this contract provided:

> The company agrees that in consideration of Jacobs maintaining the office and being in personal attendance during specified hours it will send to him for examination all customers for glasses coming to defendant's store requiring or requesting through its optical department such examination and will pay him for each examination $2.75, settlement to be made on stated days. Jacobs agrees to purchase, maintain, and keep complete up-to-date equipment, and to make examinations of all customers on the basis of fees stipulated. Jacobs is also to have the right to carry on his own practice at said location and to collect and retain his fees therefor. Jacobs also agrees the company may by advertisement refer to the fact that an arrangement has been made with him to make such examinations, . . .

It would seem axiomatic, said the Supreme Court, where a statute requires a practitioner of optometry to be a person who is 21 years of age, of good moral character, and possessing specified educational qualifications, that no corporation may comply with such requirements. The court was convinced that the practice of optometry in Kansas is limited to individuals. The optometry act, continued the court, provides that any person shall be deemed a practitioner of optometry who shall display any advertisement offering in any manner to examine eyes, test eyes, or fit glasses with intent to induce people to avail themselves of the services advertised. The admission of the corporation that it advertised the free services of an optometrist convicted it of violating this provision of the act. The Supreme Court was not impressed by the argument on behalf of the corporation that it changed its method of doing business on July 19, 1935, and that thereafter the optometrist was in control of the business and that it, the corporation, had no control over it. A similar arrangement was denounced, said the court, in *State* v. *Kindy Optical Company,* 216 Iowa 1157, 248 N. W. 332, in *Eisensmith* v. *Buhl Optical Company* (W. Va.), 178 S. E. 695, and in *Winslow* v. *Kansas State Board of Dental Examiners,* 115 Kan. 450, 223 P. 308. The contract of employment and the lease connected with it were devices, the court said, to avoid the provisions of the optometry practice act.

The Supreme Court therefore ordered that the corporation be ousted as a corporation exercising any claim, right or power to practice optometry, and that it be enjoined from doing any act constituting the practice of optometry. *State ex rel. Beck, Atty. Gen. v. Goldman Jewelry Co. (Kan.), 51 P. (2d) 995.*

Workmen's Compensation Acts: Relationship Between Silicosis and Disability; Expert Testimony.—The sole question involved in this case was whether silicosis, which admittedly the claimant had, was a substantial factor in causing his disability, the exact nature of which the record does not disclose. The compensation commissioner dismissed the claim for compensation but, on appeal by the claimant, the superior court granted compensation. The employer thereupon appealed to the Supreme Court of Errors of Connecticut.

Three physicians testified before the commissioner. Two were of the opinion that silicosis was a substantial factor in causing the disability; the other, an expert in diseases of the lungs appearing for the employer, testified to the contrary. A finding or a conclusion, said the Supreme Court of Errors, cannot be held to be erroneous merely because it was based on the testimony or opinion of one witness in opposition to that of several others testifying to the contrary. A conclusion reached on comparison and examination of conflicting professional opinion, by reliance on one rather than another, can rarely be found erroneous in law in the absence of bad faith. The witness on whose testimony the commissioner relied in disallowing compensation gave as his reasons for his opinion that the silicosis was not a substantial factor in causing the disability the facts that the claimant was not suffering from shortness of breath, that the history given him by the claimant and his examination showed severe abdominal pain and tenderness from the beginning of the disability, and that the degree of silicosis, in his judgment, was late first or early second stage and not sufficient to cause disability. He testified that he did not have the benefit of a fluoroscopic examination in forming his opinion as had the two physicians who testified for the claimant. He was unable to determine the cause of the claimant's disability. We cannot say, said the court, that the commissioner could not have reasonably based his conclusion on the opinion advanced by this witness. In the conflict of opinion among the witnesses as to the cause of the claimant's disability, it was the province of the commissioner to determine the matter, and with his conclusion, the court said, neither the superior court nor the Supreme Court of Errors may interfere. The case was therefore remanded to the superior court with directions to dismiss the claimant's appeal. *Kulak v. Landers, Frary & Clark (Conn.), 181 A. 720.*

Society Proceedings

COMING MEETINGS

American Physiotherapy Association, Los Angeles, June 28-July 2. Miss Jefferson I. Brown, Tichenor Hospital School, Long Beach, Calif., Secretary.

Conference of State and Provincial Health Authorities of North America, Vancouver, B. C., June 22-24. Dr. A. J. Chesley, State Department of Health, St. Paul, Minn., Secretary.

Maine Medical Association, Rangeley, June 21-23. Miss Rebekah Gardner, 22 Arsenal St., Portland, Secretary.

Medical Library Association, St. Paul, June 22-24. Miss Janet Doe, 2 E. 103d St., New York, Secretary.

Montana, Medical Association of, Billings, July 8-9. Dr. E. G. Balsam, 208½ North Broadway, Billings, Secretary.

North Pacific Pediatric Society, Victoria, B. C., June 24-25. Dr. M. L. Bridgeman, 1020 S. W. Taylor St., Portland, Ore., Secretary.

Pacific Northwest Medical Association, Portland, Ore., July 8-11. Dr. C. W. Countryman, 407 Riverside Avenue, Spokane, Wash., Executive Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to THE JOURNAL in continental United States and Canada for a period of three days. Periodicals are available from 1926 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Cancer, New York

26: 703-928 (April) 1936

Multiple Primary Tumors of the Brain: Review of Literature and Report of Twenty-One Cases. C. B. Courville, Los Angeles.—p. 703.

*Malignant Melanomatosis. F. B. Plewes, Toronto.—p. 732.

Thyroxine Production in Metastases from Carcinoma of Thyroid. R. B. Engelstad, Oslo, Norway.—p. 738.

*Experimental Production of Visceral Tumors with Hydrocarbons. F. W. Ilfeld, Boston.—p. 743.

Production of Cancer by Hydrocarbons Other Than Those of Phenanthrene Type. A. A. Morton, C. F. Branch and D. B. Clapp, Boston.—p. 754.

Relation Between Incidence of Mammary Cancer and Nature of Sexual Cycle in Various Strains of Mice: II. Relative Constancy of Characteristics of Sexual Cycle in These Strains. V. Suntzeff, E. L. Burns, Marian Moskop and L. Loeb, St. Louis.—p. 761.

Precipitation Tests in Mice: Preliminary Report: I. Cancer; II. Comparative Study of Cancer Susceptible and Immune Mice. L. C. Strong and T. H. Werner, Bar Harbor, Maine.—p. 767.

Effect of Shwartzman Reaction with Bacterial Filtrate on Transplantable Tumors in Animals. M. Jacobi, Brooklyn.—p. 770.

Carcinoma of Tongue in a New-Born Child: Report of Case. L. W. Frank, C. D. Enfield and A. J. Miller, Louisville, Ky.—p. 775.

Primary Adenocarcinoma of Liver in a Rooster. J. C. Norris, Atlanta, Ga.—p. 778.

Adenocarcinoma of Sigmoid with Lymphatic Leukemia Blood Picture: Case. C. Reich, New York.—p. 781.

Preparation of Dispersions of Carcinogenic Hydrocarbons in Serum: Note. E. Lorenz and H. B. Andervont, Boston.—p. 783.

Malignant Melanomatosis.—Plewes cites a case of malignant melanomatosis in which the first manifestations were those of sacro-iliac disease of rapid onset. The diagnosis was finally established by biopsy as secondary melanotic sarcoma. Search of numerous cutaneous moles, eyes, rectum and other possible sites for primary malignancy failed. There was widespread dissemination of malignant tumors, sometimes nonpigmented, which especially invaded the pelvic bones as well as the spine, ribs and skull, large veins and serous surfaces, and lymph nodes.

Visceral Tumors Induced with Hydrocarbons.—Ilfeld's experiments show that cancer can be induced in some of the visceral organs with certain carcinogenic hydrocarbons. He implanted cholesterol pellets containing 5 per cent of either 1:2:5:6-dibenzanthracene, methylcholanthrene or 1:2 benzpyrene into the kidney, spleen, liver, uterus, testicle, bone marrow, subperiosteum, stomach or brain of 244 experimental animals. Twelve renal tumors were caused by 1:2:5:6-dibenzanthracene cholesterol pellets and were epidermoid carcinomas. One renal tumor was transplanted through four generations of mice. The tumors seem to have originated from renal pelvic epithelium. There was a definite incubation period (average nine months) for the renal tumor; i. e., until it was large enough to be felt. The malignant change in mice and rats required a period of months. Examination of the fourteen kidneys containing dibenzanthracene pellets and having no tumor showed a moderate inflammatory reaction around the pellet with infiltration of polymorphonuclear leukocytes, lymphocytes and monocytes. In some slides renal pelvic epithelium partially or completely surrounded the pellet either in a single or in a stratified layer. This first reaction of the epithelium seemed to be a protective mechanism. The epithelial cells in most instances were supported by dense collagenous connective tissue. After coming into contact with the hydrocarbon, the epithelial cells became stratified and later assumed malignant characteristics, as shown by invasive downgrowths. The prolonged tumor incubation period might be considered as pointing to chronic irritation as the causative factor rather than chemical change. However, the evidence is not sufficient to warrant a definite conclusion. The animals which had received the largest doses of dibenzanthracene developed tumors the earliest. While the amount of dibenzanthracene in the pellet varied from 0.08 to 0.6 mg., the amount of dibenzanthracene actually in contact with the cells was only that present on the surface of the pellet. Compared with the total amount of dibenzanthracene present in the pellet, this must have been a very small quantity. One fibrosarcoma was produced in the experiment. In this instance a pellet containing methylcholanthrene had been implanted in the spleen of a stock mouse. This tumor originated either from the connective tissue of the spleen or from the stroma of the pancreas, probably the former. In two tumors of the liver caused by dibenzanthracene the microscopic appearance is indefinite, because of postmortem changes; in one of these tumors it is consistent with the appearance of a primary liver cell carcinoma. A uterine tumor caused by dibenzanthracene is an epidermoid carcinoma originating from the endometrium. The results of inserting pellets into the other organs so far have been negative.

American J. Obstetrics and Gynecology, St. Louis

31: 549-730 (April) 1936

*Probable Rôle of Hypercholesteremia of Pregnancy in Producing Vascular Changes in Placenta, Predisposing to Placental Infarction and Eclampsia. R. A. Bartholomew and R. R. Kracke, Atlanta, Ga.—p. 549.

Fetal Blood Studies: V. Rôle of Anesthesia in Production of Asphyxia Neonatorum. N. J. Eastman, Baltimore.—p. 563.

Period of Puberty and Inception of Menstruation. C. F. Fluhmann, San Francisco.—p. 573.

Statistical Studies on Puerperal Infection: II. Analysis of Five Hundred and Forty-Five Cases of Puerperal Infection (Including Comparison Between Them and Similar Group of Cases with Normal Puerperiums). C. H. Peckham, Baltimore.—p. 582.

Dührssen's Incisions: Analysis of Five Hundred and Ninety-Two Cases. A. B. Hunt, Rochester, Minn., and W. B. McGee, San Diego, Calif.—p. 598.

Argyria Uteri. G. Gellhorn, St. Louis.—p. 613.

Varying Patterns of Dried Blood Serum of Women. J. T. Smith, Cleveland.—p. 618.

*Interstitial Radiation of Cervix, with Suggested Modification of Taussig's Operation. C. Duncan, Brooklyn.—p. 623.

Double Malignant Tumors of Uterus. V. S. Counseller and W. L. Butsch, Rochester, Minn.—p. 628.

Treatment of Amenorrhea: II. Effects of Anterior Pituitary-like Hormone from Urine of Pregnant Women: Eleven Trials in Four Patients. J. Rock and M. K. Bartlett, Boston.—p. 634.

Incidence and Treatment of Secondary Anemia in Outpatient Maternity Patients. O. J. Toland, Philadelphia.—p. 640.

Rôle of Amniotic Sac in Labor. L. C. Spademan, Detroit.—p. 645.

Hemoglobinuria as Symptom of Ruptured Ectopic Pregnancy. W. T. Pommerenke, Rochester, N. Y.—p. 650.

Treatment of Senile Vaginitis with Estrogenic Hormones. A. Jacoby, New York, and B. Rabbiner, Brooklyn.—p. 654.

Analysis of Five Hundred and Sixty-Nine Forceps Operations. H. F. Kane and H. P. Parker, Washington, D. C.—p. 657.

Adenocarcinoma of Supernumerary Breasts of Labia Majora in Case of Epidermoid Carcinoma of Vulva. H. J. Greene, Brooklyn.—p. 660.

Observations on Use of Collip's Emmenin in Menopause. Catharine Macfarlane, Philadelphia.—p. 663.

Massive Collapse of Lung Complicating Parturition. H. B. Wilson, Hackensack, N. J.—p. 667.

Pregnancy in Sporadic Cretinism. R. J. Patton, Ann Arbor, Mich.—p. 670.

Normal Human Ovum in Stage Preceding Primitive Streak. E. A. Edwards, H. O. Jones and J. I. Brewer, Chicago.—p. 672.

Spontaneous Delivery Complicated by Rectal Stricture, Rectovaginal Fistula and Rupture of Rectum. F. A. Kassebohm and M. J. Schreiber, New York.—p. 674.

Septate Vagina Complicating Labor. G. N. Adamson, Chicago.—p. 676.

Fibromyoma of Cervix Uteri: Three Cases, One Developing Cervical Stump After Hysterectomy. J. P. Greenhill, Chicago.—p. 678.

Interstitial Pregnancy. F. C. Spencer, Honolulu, Hawaii.—p. 680.

Complete Torsion of Tube and Ovary Complicating Pregnancy. D. Sheldon, Sandusky, Ohio.—p. 682.

Obstetric Effigies of Mound Builders of Eastern Arkansas. S. C. Dellinger, Fayetteville, Ark., and E. G. Wakefield, Rochester, Minn.—p. 683.

Primary Tuberculosis of Vagina. J. L. McGoldrick, Brooklyn.—p. 684.

Fatal Case of Yeast Meningitis in Pregnancy. H. J. Timerman, Chicago.—p. 686.

Hypercholesteremia of Pregnancy.—Bartholomew and Kracke believe that the hypercholesteremia of pregnancy is probably a normal physiologic response to meet the requirements of rapid cell growth in the fetus and prepare for lactation. An excessive degree of hypercholesteremia of pregnancy is probably due to hyperpituitary or hypothyroid activity and

is further increased by a diet high in cholesterol-containing foods. Hypercholesteremia is probably the fundamental basis for the toxemias of pregnancy. It probably is responsible for nausea and vomiting of pregnancy, through an increased secretion into the bile until storage of this material can take place in the reticulo-endothelial system. Excessive storage in the liver in the first half of pregnancy is probably the cause of excessive fatty change in the periphery of the liver lobules with subsequent central necrosis in the inner zone of the lobules, which is so consistently found in fatal cases of pernicious vomiting of pregnancy. Excessive storage in the placental arteries with resulting vascular changes is the predisposing cause of infarction in the placenta. Thrombosis or rupture of a placental artery, occurring either spontaneously or produced by the trauma of fetal movements, is the exciting cause of acute infarction in the placenta. Acute or subacute infarction in the placenta results in autolysis of the affected tissue, with the liberation of peptone, guanidine and histamine as toxic split products of placental protein. The amount and location of the infarction, the degree of vessel obstruction and the rapidity of autolysis determine whether preeclampsia of mild or severe degree, eclampsia or premature detachment of the placenta will occur. If hypercholesteremia is the fundamental basis for the toxemias of pregnancy, it would seem that prophylaxis should be directed toward neutralizing the effect of excessive secretion of cholesterol into the intestinal tract through the bile and preventing excessive storage of cholesterol in the endothelial system by the administration of thyroid extract or iodine and restricting the use of fats and cholesterol-containing foods during pregnancy.

Interstitial Irradiation of Cervix.—Duncan suggests the following modification to Taussig's procedure (*Am. J. Obst. & Gynec.* **28**:650 [Nov.] 1934; abstr. THE JOURNAL, Jan. 12, 1935, p. 152): 1. That the patient receive the initial roentgen and radium irradiation locally two months prior to operation and that the radium dose not exceed 6,000 mg. hours. 2. That the blood supply of the uterus be reduced by the resection of the uterine arteries, as reduction of blood supply decreases the spread of malignant tumors. 3. That sixteen 1-millicurie radon seeds be implanted; eight in the lower uterine segment, two in each broad ligament near the uterus and two in each sacro-uterine ligament. This would give a total radiation dose of 2,128 millicurie hours. 4. That all the retroperitoneal fat that is exposed be removed, for it may contain small lymph nodes.

American Journal of Ophthalmology, St. Louis

19: 287-370 (April) 1936

*Congenital and Familial Cysts and Flocculi of Iris. A. Cowan, Philadelphia.—p. 287.
Aniseikonia. E. J. Ludvigh, Boston.—p. 292.
Value of Ophthalmoscopic Examination in Diagnosis of Systemic Diseases. W. M. Yater, Washington, D. C.—p. 302.
Familial Cornea Plana, Complicated by Cataracta Nigra and Glaucoma. H. Barkan and W. E. Borley, San Francisco.—p. 307.
Synthetic Suprarenin Bitartrate as Mydriatic. W. D. Horner and J. Bettman, San Francisco.—p. 311.
Cause of Voluntary Forward Luxation of Eyeball: Case Report with Anatomic Findings at Necropsy. D. J. Lyle and J. S. McGavic, Cincinnati.—p. 316.
Dinitrophenol Cataracts with Signs of Tetany. E. B. Spaeth, Philadelphia.—p. 320.
Phytopharmacologic Approach to Some Ophthalmologic Problems. D. I. Macht, Baltimore.—p. 324.
Postoperative Endogenous Infections of Eye: Report of Unusual Case. D. Kravitz, Brooklyn.—p. 328.

Congenital and Familial Cysts and Flocculi of Iris.—Cowan observed four cases of familial and congenital cysts of the retinal pigment layer of the iris, three of which he describes; in the fourth pateint, now dead, a sister of one of the present patients, the anomaly was pronounced. The cysts were bilateral in each instance and consisted of pigmented masses and pouches filled with fluid, which projected from the posterior layers of the iris through the pupil and into the anterior chamber. Contraction of the pupil caused them to protrude farther into the anterior chamber. The cysts were capable of emptying and refilling. The ocular examinations were otherwise negative except that one patient had a divergent concomitant squint. Medical examination was negative in two of the cases; in the other there was a history of mental deficiency and chorea. The familial tendency of the condition in these cases is sufficient verification that it is congenital in character, and that it is developmental and not the result of intra-uterine traumatism, as has been proposed. The theory of von Szily and Gallemaerts that it is due to a failure of closure of the annular sinus is logical, but the appearance of the stroma in these cases proves that this also is faulty in development and should be included in the malformation. The anomaly differs only in degree from that which is termed congenital ectropium uveae. There is also some justification for the traction theory of Vogt in the fibrous bands at the 2 o'clock position. But this was the only place in which, after careful observation of all six eyes, even a semblance of any adhesion was found between the pigmented epithelium and the stroma. It hardly lends weight to Vogt's hypothesis.

American Review of Tuberculosis, New York

33: 435-584 (April) 1936

*Pneumoperitoneum in Intestinal Tuberculosis: Appraisal of Various Therapeutic Procedures. D. Salkin, Hopemont, W. Va.—p. 435.
Leukocytic Counts During Bedrest Compared with Those During Exercise in Tuberculous and Nontuberculous Cases. E. M. Medlar, Mount McGregor, N. Y.—p. 473.
Bilateral Artificial Pneumothorax in Treatment of Pulmonary Tuberculosis. H. F. Carman, Dallas, Texas.—p. 491.
*Bilateral Simultaneous Artificial Pneumothorax in Treatment of Pulmonary Tuberculosis: Report of Thirty-Six Patients. J. N. Corsello and R. M. Bruckheimer, Cassadaga, N. Y.—p. 502.
Effusion Following Artificial Pneumothorax: Review of One Hundred and Fifty Cases at Essex Sanatorium, Middleton, Mass. J. I. Weisman, Springfield, Mass.—p. 522.
End Results of Surgical Treatment of Pulmonary Tuberculosis. P. B. Matz, Washington, D. C.—p. 533.
Observations on Tuberculosis Work in Germany. H. E. Kleinschmidt, New York.—p. 549.
Cost of Tuberculosis to Industry, to the Individual and to the Community. W. A. Sawyer and E. K. Richard, Rochester, N. Y.—p. 558.
Inexpensive Synthetic Medium for Growing Mycobacterium Tuberculosis. S. Wong and J. Weinzirl, Seattle.—p. 577.

Pneumoperitoneum in Intestinal Tuberculosis.—Salkin declares that the treatment of secondary ulcerative intestinal tuberculosis is at the present time in the same stage as pulmonary tuberculosis was ten years ago. A hopeful view may now be taken despite the absence of a specific cure, as the various available modes of therapy may remove 80 per cent of the severe cases as complicating factors. Drugs and calcium are of secondary importance in themselves but highly useful with other agents; surgery has a very limited place; the diet may be individually selected. Ultraviolet irradiation benefits 40 per cent of moderate and 15 per cent of severe cases; vitamins benefit 67 per cent of moderate and 27 per cent of severe cases; pneumoperitoneum benefits all moderate and 80 per cent of severe cases. A new classification is offered, based on the roentgenologic extent of the lesion and the degree of symptomatic severity. The ulcerated intestine is influenced by two factors in its production of a state of spasm or irritability; namely, a local neuromuscular reaction and an extrinsic afferent-parasympathetic efferent reflex. It is possible that light and vitamins affect the threshold of irritability of the local factor, whereas pneumoperitoneum disturbs the proper function of the extrinsic reflex. Healing of ulcers takes place by a local and general increase of immunity further benefited by release of spasm and removal of distressing symptomatology. The existing views on prophylaxis and therapy must be modified and the presence of intestinal disease be regarded as an indication for active pulmonary collapse. The mode by which the air acts on the extrinsic nerves is problematic. The air acts by dampening the stimuli and thus may be likened to a buffer. The author concludes that air therapy acts by removing the extrinsic nerve reflex by a mechanical buffer action. The fact that ascites often causes an asymptomatic state in an ulcerated intestine shows further the mechanical action of a fluid body in the peritoneal cavity.

Bilateral Pneumothorax in Treatment of Tuberculosis.—Corsello and Bruckheimer do not advocate that all cases of advanced tuberculosis be subjected to bilateral pneumothorax irrespective of the patient's condition, but the measure should not be considered an agency of last resort. Cases that are obviously terminal or those in which the patient is dyspneic even while at rest because of extensive disease should not be subjected to the treatment. Those presenting caseopneumonic

lesions have responded most poorly to the treatment. Complications occurring during the course of treatment are the same as in unilateral pneumothorax: the most spectacular and distressing complication is that of a ruptured lung. While complications occur more frequently than in unilateral pneumothorax, this increased incidence is not great enough to contraindicate its use. Coulaud, among others, advises that patients with clinical tuberculous enteritis should not be treated by this method. However, the authors cannot wholly subscribe to this view. An involvement such as this undoubtedly adds to the hazards of the case, but recovery is possible in certain instances if satisfactory pulmonary collapse is obtained. In their patients who had intestinal tuberculosis and in whom the result was unsuccessful, they find that without exception all had unsatisfactory collapse of one or both sides. It is conceivable that with effective pneumothorax the result might have been different. One patient, who was gravely ill and had a severe intestinal involvement, made a gratifying recovery after both lungs were effectively collapsed. Of the authors' thirty-six patients having advanced pulmonary tuberculosis treated by bilateral simultaneous artificial pneumothorax, twenty-one are still alive, in eighteen of whom the disease is arrested or apparently arrested, and two are improved. One has suffered a recent reactivation of the disease after being well for two years, one year of which was after termination of treatment. Seven of those now living have returned to work. Nine others should be able to work in the near future.

Annals of Surgery, Philadelphia

103: 481-640 (April) 1936

*Surgical Treatment of Syringomyelia. C. H. Frazier and S. N. Rowe, Philadelphia.—p. 481.
Complete Sympathectomy: Observations of Certain Vascular Reactions During and After Complete Exclusion of Sympathetic Nervous System in Dogs: Experimental Study. H. Wilson, N. W. Roome and K. Grimson, Chicago.—p. 498.
*Lumbar Ganglionectomy and Trunk Resection in Chronic Arthritis. F. A. Bothe, Philadelphia.—p. 510.
Therapeutic Effects Following Interruption of Sympathetic Nerves: Report on Alcohol Block in Certain Arthritis and Vascular Cases. R. H. Patterson and W. J. Stainsby, New York.—p. 514.
Use of Avertin (Tribrom-Ethanol) in Neurosurgery. J. Rossier, Lausanne, Switzerland, and W. P. Van Wagenen, Rochester, N. Y. —p. 535.
Tumors of Carotid Body. E. W. Peterson and L. H. Meeker, New York.—p. 554.
Digestive Phenomena in Psychopathic Patient. E. L. Eliason and V. W. M. Wright, Philadelphia.—p. 572.
Liver Stones. I. G. Rufanov, Moscow, U. S. S. R.; translated by A. J. Walscheid, New York.—p. 580.
True Proliferating Cystic Lymphangioma of Mesentery. E. O. Parsons, Kansas City, Mo.—p. 595.
Conservative Treatment of Acute Hematogenous Osteomyelitis. E. T. Crossan, Philadelphia.—p. 605.
Orr Treatment of Pyogenic Osteomyelitis. J. Kulowski, St. Joseph, Mo.—p. 613.
End Results of Excision of Elbow. B. F. Buzby, Camden, N. J.—p. 625.

Surgical Treatment of Syringomyelia.—Frazier and Rowe report two cases of syringomyelia in which surgical treatment resulted in improvement over periods of four and one half and two years, respectively. Fourteen additional cases from other clinics, whose period of postoperative observation was one year or more, have been analyzed. A review of the results in the sixteen cases shows that eight of the patients were sufficiently improved to return to their former occupations. Sex, age, the extent of the process or the preoperative clinical picture seemed to have little bearing on the operative results. Probably the duration of the disease and the technic employed may influence the end results to a certain extent. A review of the various technics employed suggests that: 1. A vertical chordotomy in the midline posteriorly or a few millimeters lateral to it on the side of the greatest cord damage (as evidenced by the clinical picture) is the most efficacious and the least dangerous approach to the syringomyelic cavity. 2. An attempt at establishing permanent drainage by the use of drainage material seems worth while. 3. If, after the initial drainage, the clinical course suggests a closure of the incision into the syringomyelic cavity, a second operation is indicated.

Lumbar Ganglionectomy and Trunk Resection in Arthritis.—Bothe points out that, from the results obtained to date, lumbar ganglionectomy is indicated only in a small percentage of patients with arthritis. It has not been used in osteo-arthritis or in hypertrophic or degenerative arthritis. The patient's general health should be maintained at the highest possible point at all times to obtain the best results. The postoperative restitution of use of the involved parts should be very slow and conservative. Heat and other physical therapeutic measures should be used with moderation as indicated. Orthopedic measures should be instituted to correct or overcome deformities. A borderline case is reported in which the clinical diagnosis was atrophic arthritis accompanied by or secondary to a vasomotor vascular disease of the extremities. The patient remained in the hospital for a period of five months, during which time all types of medical treatment had been instituted with no improvement. A bilateral lumbar ganglionectomy and trunk resection were performed. A periarterial sympathectomy was performed on the left common iliac artery. There was immediate improvement in the surface temperature and color of the involved parts. The postoperative routine of gradual introduction of exercise to the involved parts was instituted. The patient left the hospital five weeks after the operation, able to walk with crutches. Four months after operation she was using a cane and walked with very little difficulty. Her general condition had improved greatly, the swelling of the parts had disappeared and there was only a slight degree of pain produced on motion of the involved joints. After discarding the cane, only a limited amount of walking was permitted, but exercise was gradually increased. Twenty-two months after the operation, her general appearance was that of a normal healthy girl. She had been able to attend school regularly for one and one-half years and was able to walk an unlimited distance without any pain or disability. Two years after operation the patient stated that she continues to notice a gradual increase in her ability to use the lower extremity, and on palpation there was no evidence of any lowered surface temperature in the right leg. A cervicothoracic sympathectomy may also be performed when this condition exists in the upper extremities.

Archives of Neurology and Psychiatry, Chicago

35: 701-936 (April) 1936

*Spontaneous Intracerebral Hemorrhage: Etiology and Surgical Treatment, with Report of Nine Cases. W. M. Craig and A. W. Adson, Rochester, Minn.—p. 701.
Lactic Acid Content of Blood and of Cerebrospinal Fluid. S. B. Wortis and Frances Marsh, New York.—p. 717.
Mental Changes Following Head Trauma in Children. A. Blau, New York.—p. 723.
Galvanic Skin Reflex and Danielopolu Test in Psychoneurotic Patients. T. L. Fentress and A. P. Solomon, Chicago.—p. 770.
Graphic Charting Method for Use in Recording Seizures of Patients with Epilepsy. Theodora Wheeler, Chicago.—p. 776.
*Effect of Increased Oxygen Pressure on Seizures of Epilepsy. W. G. Lennox and A. R. Behnke Jr., Boston.—p. 782.
Effect of Experimental Temporary Vascular Occlusion on Spinal Cord: I. Correlation Between Structural and Functional Changes. L. L. Tureen, St. Louis.—p. 789.
Macular Vision Following Cerebral Resection. J. C. Fox Jr. and W. J. German, New Haven, Conn.—p. 808.
Origin of Senile Plaques. S. Hiroisi and C. C. Lee, Fukuoka, Japan. —p. 827.
Neural Projection of Cochlear Spirals on Primary Acoustic Centers. F. H. Lewy, Philadelphia, and H. Kobrak, Chicago.—p. 839.

Spontaneous Intracerebral Hemorrhage.—Craig and Adson state that in two of their nine cases the etiology of spontaneous intracerebral hemorrhage was definitely the result of trauma. In another case the symptoms occurred two weeks after a period of strenuous exertion and emotional strain. In another case the hemorrhage was associated with rheumatic heart disease and endocarditis due to Streptococcus viridans, suggesting bacteriologic origin. In another case the etiology is uncertain, as the patient was found unconscious after having fallen from a wagon, and it was difficult to determine whether or not the unconsciousness preceded the fall. In two cases hemorrhage evidently occurred spontaneously when the patients (one a woman) were under emotional stress; there were no other etiologic factors. In the eighth case hemorrhage must have been traumatic in origin, although there was a history of injury twelve years previously, and in the ninth case hemorrhage occurred suddenly without apparent cause. After the clot had been evacuated and the cavity explored at operation there were no active bleeding points; in one case a pseudomembrane surrounded the hemorrhage, and it was removed.

This would seem to disprove the theory that the bleeding was of arterial origin; it is the authors' opinion that the spontaneous intracerebral hemorrhage was of venous origin.

Effect of Increased Oxygen Pressure on Epilepsy.—Lennox and Behnke subjected to a high oxygen tension three young women who were having numerous petit mal attacks daily and with whom experience over a period of years had demonstrated that seizures invariably followed either the breathing of a low oxygen mixture or hyperpnea. On five occasions, one or more of the patients and the authors spent from three and one-half to five hours in a compression chamber under an absolute pressure of 4 atmospheres. Aside from the effect on seizures, they observed that, while under pressure, patients experienced about the same degree of mild intoxication as the observer. The only suggestive neurologic symptom was paresthesia in the distribution of an ulnar nerve in one patient. On days on which experiments were not carried out and which may be considered representative of the normal record of the patients, they had seizures at the average rate of 1.43 per hour; in the chamber the rate was 0.78 per hour. The excitement and discomfort of the experience might be expected to cause some increase in the number of seizures, but during the period of increased pressure spontaneous attacks were only 55 per cent as frequent as usual. Observations were made to determine the effect of varying pressures of oxygen on the length of time required to induce a seizure by this means. During the period of the test, patients while breathing oxygen were under an oxygen pressure nearly five times greater than the pressure while breathing air. Pressures of oxygen between zero and 3,000 mm. of mercury were obtainable. Twenty-eight hyperpnea experiments were made. The volume of air respired was calculated from the excursions of the bell of a Collins basal metabolism machine. In each of the patients, as the pressure of oxygen was increased, precipitation of a seizure by overventilation progressively required more time. The previous state of oxygen pressure seemed to exercise some influence. With a patient at a certain pressure, a greater volume of hyperpnea was necessary to induce a seizure when the patient was "coming down" from a higher pressure than when she was "going up." In one patient, when oxygen pressure was increased twenty-fold, the lung ventilation required to produce a seizure increased five-fold. Decreased oxygen tension tends to precipitate and increased oxygen tension tends to prevent petit mal seizures.

Archives of Ophthalmology, Chicago

15: 589-802 (April) 1936

Functional Disturbances of Eyes. A. Bielschowsky, Hanover, N. H. —p. 589.

Homonymous Hemianopia: Practical Points in Interpretation, with Report of Forty-Nine Cases in Which the Lesion in the Brain Was Verified. T. H. Johnson, New York.—p. 604.

Contact Glasses, the "Invisible" Spectacles. J. Dallos, Budapest, Hungary.—p. 617.

*Artificial Fever Therapy in Cases of Ocular Syphilis. A. M. Culler and W. M. Simpson, Dayton, Ohio.—p. 624.

Association of Ectopia Lentis with Arachnodactyly. F. E. Burch, St. Paul.—p. 645.

Advanced Stage of Diktyoma: Report of Case. P. S. Soudakoff, Peiping, China.—p. 680.

Tumor of Optic Nerve: Report of Case. F. A. Kiehle, Portland, Ore. —p. 686.

Anatomic Phorias. F. W. Dean, Council Bluffs, Iowa.—p. 692.

Primary Tumor of Optic Nerve: Report of Case. T. O. Coston, Baltimore.—p. 696.

Artificial Fever Therapy in Ocular Syphilis.—Culler and Simpson subjected fifty-eight patients with syphilis who had an ocular complication of the disease to artificial fever therapy. In the fifty-eight cases diagnosis of the primary conditions was made in sixty-two eyes. In the 116 eyes associated secondary conditions due to syphilis were observed. The Kettering hypertherm was used for the induction and maintenance of fever. Approximately fifty hours of fever with temperatures above 105 F. in ten weekly sessions of five hours each was the rule. A course of thirty injections of bismarsen was given in conjunction with the fever treatments. Most of the patients with ocular syphilis who were chosen for this study had failed to respond to orthodox therapy. Of the eleven patients with interstitial keratitis, eight had experienced recurrences and ten had failed to respond to chemotherapy. The duration of the disease and the tendency to recurrence appear to be distinctly lessened after the adequate fever therapy combined with chemotherapy. The response is most prompt in the cases in which an opaque central disk of plastic exudate exists. In ten cases of exudative uveitis prompt clinical improvement became apparent in every instance after the first one or two fever treatments. Nine patients recovered useful vision. Favorable response occurred in the lesions of fourteen patients with optic neuritis and neuroretinits. All the patients recovered useful vision, although nine have residual pallor of the disk and some degree of contraction of the fields. Active neuritis of the optic tract appears to be arrested by fever therapy. Active choroiditis in seven patients subsided with fever therapy, with residual scars and defects of the fields. Good central vision resulted in all but one eye. In sixteen patients with atrophy of the optic nerve the visual acuity and visual fields remained practically unaltered after a course of fever therapy combined with chemotherapy. As in neurosyphilis, there is no parallelism between the clinical and the serologic response of syphilitic ocular disease to fever therapy combined with chemotherapy. The greatest field of usefulness for artificial fever therapy combined with specific therapy will ultimately be in its application to the early manifestations of syphilis, with a view to prevention of the often disastrous ocular complications.

Canadian Medical Association Journal, Montreal

34: 369-486 (April) 1936

*Intracranial Division of Vestibular Portion of Auditory Nerve for Ménière's Disease. K. G. McKenzie, Toronto.—p. 369.

Radiologic Findings in Prepyloric Lesions. A. C. Singleton, Toronto. —p. 382.

Artificial Pneumothorax in Lobar Pneumonia: Report of Ten Cases. J. G. Howlett, R. Luft and E. B. Astwood, Montreal.—p. 387.

Hodgkin's Disease of Bone. M. C. Morrison, London, Ont.—p. 393.

*Oxycephaly: Report of Two Cases in Brother and Sister. D. L. Klein and A. E. Childe, Montreal.—p. 397.

Protamine Insulin. R. B. Kerr, C. H. Best, W. R. Campbell and A. A. Fletcher, Toronto.—p. 400.

Mesenteric Lymphadenitis in Adolescents Simulating Appendicitis. D. C. Collins, Los Angeles.—p. 402.

Significance of Menopausal Flowing. W. P. Tew, London, Ont.—p. 405.

Making Ether an Ideal Anesthetic. W. N. Kemp, Vancouver, B. C. —p. 409.

Ileus Associated with Transient Renal Insufficiency. N. B. Gwyn, Toronto.—p. 412.

Some Entozoa of Man as Seen in Canada and South Africa. H. B. Fantham and Annie Porter, Montreal.—p. 414.

Visceral Behavior in Neuroses. D. G. Campbell, Chicago.—p. 422.

Intracranial Division of Auditory Nerve for Ménière's Disease.—Since August 1931 McKenzie has carried out unilateral section of the vestibular portion of the auditory nerve on twelve patients. As a result of this experience he has concluded that it is possible to section the vestibular portion of the nerve with sufficient accuracy for clinical requirements. The caloric response is abolished and the attacks of vertigo cease, while at the same time the cochlear fibers function as before operation. The first patient was operated on in August 1931 but proved to be an unsatisfactory subject, as she had little or no hearing before operation. The second patient, however, had good hearing and satisfactorily proved the possibilities of this new procedure. One of the twelve patients died from a wound infection eleven days after operation. Apart from this unfortunate mishap, the results obtained have been very satisfactory. They are all extremely grateful for the relief which they have obtained, and although the postoperative period is short, varying from three years and five months to five months, one has no reason to anticipate a return of attacks. For a few weeks or months there has been a moderate degree of unsteadiness. This gradually disappears and patients become confident and cheerful and quite certain of their balance. Occasionally, on turning quickly in the dark, there is a slight tendency to fall to the involved side. Two of nine patients have had complete cessation of tinnitus, two were unchanged, and in five there has been a marked diminution. With two exceptions, all patients had an absence of the caloric response after operation. These have remained free from attacks, and this observation suggests that it is not necessary to cut all vestibular fibers to cure a patient. Of the twelve patients seven had such poor hearing on the involved side that it was of little importance to save the cochlear fibers. In each instance, however, the hearing which they did have was not impaired by the

operation and they have remained free of attacks. The remaining five patients had useful hearing, but two failures occurred in this group. One patient died and in the second case the cochlear fibers were unintentionally cut. The records of hearing before and after operation on the other three patients with good hearing illustrate the value of this operative procedure when it is desirable to save the cochlear fibers. The records show that hearing is being maintained on the involved side.

Oxycephaly.—Klein and Childe differentiate between true and delayed oxycephaly and what Greig terms "false oxycephaly." They cite two typical cases of true oxycephaly which occurred in a brother and sister. In spite of the obvious cranial deformity, the children had no complaints that would attract the attention of the examiner to the site of trouble. The diagnosis was established by the signs elicited on physical and roentgenographic examination. It has been suggested that oxycephaly may be hereditary, and the authors feel that their two cases tend to support this theory.

Johns Hopkins Hospital Bulletin, Baltimore

58: 137-266 (March) 1936

Calcium and Phosphorus Studies: XII. Six Years' Clinical Experience with Viosterol in Prevention and Treatment of Rickets, Tetany and Allied Diseases. D. H. Shelling and Katherine B. Hopper, Baltimore.—p. 137.

Experimental and Pathologic Studies on Pathogenesis of Acute Hemorrhagic Pancreatitis. A. R. Rich and G. L. Duff, Baltimore.—p. 212.

Journal of Lab. and Clinical Medicine, St. Louis

21: 663-774 (April) 1936

Observations on Hydrogen Ion Concentration of Clotting and Citrated Blood. J. H. Ferguson, University, Ala., and D. DuBois, New Haven, Conn.—p. 663.

Auricular Flutter with 1:1 Response: Case Report. J. B. Carter and E. F. Traut, Chicago.—p. 670.

*Fluctuations in Basophilic Aggregation Counts with Meteorologic Alterations. G. H. Gowen, Chicago.—p. 677.

Lymphogranulomatosis (Hodgkin's Disease): Review of Sixty Cases. F. J. Krueger and O. O. Meyer, Madison, Wis.—p. 682.

Response of Blood Urea Nitrogen, Uric Acid and Plasma Cholesterol to Parenteral Liver Extract. D. Scheinberg, Philadelphia.—p. 690.

Autohemagglutinin. W. P. Belk, Ardmore, Pa.—p. 697.

*Medical Aspects of Periodontoclasia and Gingivitis. J. C. Healy, F. H. Daley and Marian H. Sweet, Boston.—p. 698.

Blood Grouping in Infectious Diseases. H. Brody, L. W. Smith and W. I. Wolff, New York.—p. 705.

*Hitherto Undescribed Micro-Organism of Alcaligenes Group. Elizabeth L. Hazen and Mary Mortillaro, New York.—p. 710.

*Normal Magnesium Metabolism and Its Significant Disturbances. B. S. Walker and Elisabeth W. Walker, Boston.—p. 713.

Antipneumococcus Serum Containing Heterophile Antibody: Laboratory and Clinical Report. G. E. Rockwell and R. Tyler, Cincinnati.—p. 721.

Some Practical Consequences of Influence of Temperature on Iso-Agglutination. Isabelle M. Townsend and A. F. Coca, New York.—p. 729.

Oxygen Absorbing Power in Presence of Certain Diseases. R. D. McCullagh, T. Jaglenski and F. Klobucar, Cleveland.—p. 732.

Recent Advances in Endocrine Diagnosis and Treatment. J. H. Hutton, Chicago.—p. 736.

Modification of the Greenberg Technic for Colorimetric Determination of Serum Protein. A. S. Minot and Margaret Keller, Nashville, Tenn.—p. 743.

Influence of Composition of Antigen-Extracts for Some Serodiagnostic Tests on Syphilis (M. B. R. II and M. K. R. II). B. Josephson, Stockholm, Sweden.—p. 751.

New Diluting Pipet for Sahli Hemoglobinometer. H. Ulrich, Boston.—p. 755.

Synchronous Motor Electric Time Clock. A. L. Bennett, Omaha.—p. 757.

Importance of Leukocyte Counts in Phagocytic Tests. Ruth Westlund Jung, Chicago.—p. 760.

Round Table for Use in Pathologic Histology. J. McLean, New York.—p. 766.

Fluctuations in Basophilic Aggregation Counts.—Gowen found that basophilic aggregation counts in normal subjects are subject to rather wide daily variations. In the four normal laboratory workers studied, these variations coincided as is evidenced by the prepared graphs showing the daily fluctuations and the similarity of curves, how the basophilic aggregation peaks correspond with the high barometric and low temperature peaks in two subjects and how the basophilic aggregation peaks correspond with the high barometric and low temperature peaks in the other two subjects. The only effect in common which could have been experienced by these different individuals would have been an influence due to meteorologic alterations. The daily fluctuations evidenced are in accord with the pressor episodes resulting from influx of polar air. Since basophilia is an indicator of immature red cells, it can be assumed that an increase in such cells is an evidence of bone marrow stimulation with a liberation of young cells, and in this case is associated with the influence of polar episodes. One basophilic aggregation count does not indicate the normal level for an individual, since the count may vary widely with the meteorologic changes. In the preliminary basophilic aggregation counts made on individuals entering an industry in which there is a lead hazard, these facts should be taken into consideration in evaluating the results of such counts.

Periodontoclasia and Gingivitis.—Healy and his associates made a study of eighty-six cases of periodontoclasia, twenty-seven cases of acute, subacute and chronic gingivitis, and ten cases of that form of gingivitis commonly found in the latter months of pregnancy. Investigation of the history of these patients revealed the incidence of some form of allergic disease, actual or presumed, in forty-six of the periodontoclasia cases and sixteen of the gingivitis cases. The occurrence of asthma, hay fever, migraine, urticaria, serum sickness, or infantile eczema in the patient's or a relative's past life was considered actual evidence of an allergic diathesis. A history of vague gastro-intestinal disturbances unexplainable by the ordinary diagnostic procedures was interpreted as a probable sign of protein hypersensitiveness. In periodontoclasia, the capillary dilatation, increase of tissue fluid and spasm of the arteries and arterioles account for the primary alteration of the gingivae and the formation of calculus. With continuance of the arterial spasm the vessels become sclerosed, the blood supply is insufficient, and there is atrophy of the tissues which are dependent on these vessels for their nutrition. The peridental fibers break down and cannot be replaced because the proper nutrition is lacking. Manipulation of the gums and removal of calculus help by relieving pressure and temporarily improve circulation by the counterirritant effect of the local trauma. Permanent improvement is rare, however, for a vicious cycle has been established. Of the ten cases of gingivitis of pregnancy studied six presented a local gingival eosinophilia. All six gave several positive skin reactions to proteins and each was allergic to lactalbumin, lactoglobulin or casein. When one realizes that milk proteins are very common allergens, the theoretical necessity of large amounts of milk in the gravid woman's prescribed diet may be questioned. In summarizing these cases, which the authors believe to be of an allergic nature, it may be said that they have certain diagnostic features in common: eosinophilia, capillary dilatation, increased permeability and exudation. Other important observations in several cases were: history of food idiosyncrasies or familial predisposition, positive skin reactions and positive skin tests with urinary proteose.

Heretofore Undescribed Micro-Organism of Alcaligenes Group.—Hazen and Mortillaro compared the homologous gram-negative bacilli cultivated from two blood specimens obtained from a fatal case of generalized infection with Bacillus bronchisepticus and the members of the abortus melitensis group. The significant differences and similarities between this and the heterologous micro-organisms are pointed out. Distinctive morphologic, cultural and biochemical characteristics indicate that it is a representative of a new and heretofore undescribed species. Because of certain characteristics, the micro-organism has been placed within the Bacillus alcaligenes group, although it differs in many respects from the type species, Bacillus faecalis-alcaligenes. It is entirely possible that infections due to this pathogen have been overlooked because of the similarity of the clinical symptoms to those of other well known diseases which are characterized by a bacteremia.

Normal Magnesium Metabolism.—The Walkers observed the range of serum magnesium in fasting normal active young adults (eighty-seven subjects) to be from 1.6 to 3 mg. per hundred cubic centimeters, with a mean value of 2.2 mg. The range in a group of ninety-one miscellaneous medical and surgical hospital cases presenting no apparent disturbance of mineral metabolism was from 1.5 to 2.9 mg. with a mean value of 2.3 mg. The twenty-four-hour urinary output of magnesium in the student group was from 32.5 to 307 mg., with a mean value of 103 mg. For the hospital group the maximum was 243 mg., the minimum 5 mg. and the mean 86 mg. In five

cases of hypertension associated with a greater or lesser degree of renal damage, abnormally high serum magnesium values were found, the highest value being 4.2 mg. in a case of terminal nephritis. In a group of cases of hypertension without severe renal damage the maximum was 2.72, the minimum 1.86 and the mean 2.36 mg. It appears that, contrary to certain statements in the literature, serum magnesium may be elevated in moderate or severe renal insufficiency, especially if associated with hypertension.

Journal of Urology, Baltimore

35: 417-490 (April) 1936

Abnormalities and Plastic Surgery of Lower Urogenital Tract. H. H. Young, Baltimore.—p. 417.

Cancer of Bladder: Study of Five-Year End Results in Six Hundred and Fifty-Eight Epithelial Tumors of Bladder in Carcinoma Registry of the American Urologic Association. The Committee of Carcinoma Registry.—p. 481.

Michigan State M. Society Journal, Grand Rapids

35: 219-292 (April) 1936

Pericarditis Complicating Subacute Bacterial Endocarditis. W. D. Mayer, Detroit.—p. 219.

Presentation of Cases of Pancreatitis. E. C. Long, Detroit.—p. 222.

Achlorhydria: Its Clinical Significance and Management. C. E. Vreeland, Detroit.—p. 226.

Tuberculosis in the Elderly. W. H. Meade, Manistee.—p. 233.

Diseases of Peripheral Arteries. W. G. Maddock, Ann Arbor.—p. 237.

Subpectoral Abscess: Suppurative Infraclavicular Lymphadenitis: Report of One Case. R. D. Scott, Flint.—p. 242.

What the Public Expects from the Maternal Health League. H. A. Furlong, Pontiac.—p. 244.

Nominal or Amnesic Aphasia: Report of Case. H. S. Mellen and I. L. Polozker, Eloise.—p. 245.

Pathogenesis and Treatment of Subcutaneous Edema. G. B. Myers, Detroit.—p. 249.

Cancer Survey of Michigan. F. L. Rector, Evanston, Ill.—p. 254.

Minnesota Medicine, St. Paul

19: 195-268 (April) 1936

Responsibility of the General Practitioner in the Tuberculosis Program of the Future. F. M. Pottenger, Monrovia, Calif.—p. 195.

Chronic Myocardial Disease. H. J. Lloyd, Mankato.—p. 203.

*Heterophile Pneumococcus Serum in Therapy of Lobar Pneumonia. J. F. Noble and F. E. Kibler, St. Paul.—p. 205.

Acute Atrophy of Bone: Report of Unusual Case Involving Radius and Ulna. M. S. Henderson, Rochester.—p. 214.

Urethral Diverticulum. W. Walters and N. W. Thiessen, Rochester.—p. 218.

Dietary Aids in Control of Constipation and Diarrhea. P. W. Brown, Rochester.—p. 221.

Recognition and Conservative Treatment of Hydronephrosis. T. H. Sweetser, Minneapolis.—p. 223.

Advances in General Anesthesia. R. M. Tovell, Rochester.—p. 227.

Postpartum Hemorrhage. J. A. Urner, Minneapolis.—p. 234.

Heterophile Pneumococcus Serum for Lobar Pneumonia.—Noble and Kibler discuss 146 cases of lobar pneumonia treated at the Ancker Hospital between November 1934 and June 1935. Fifty patients were treated with heterophile pneumococcus serum and ninety-six received nonspecific therapy. Of the fifty patients treated with serum, nine died. Of the ninety-six patients treated nonspecifically, thirty-eight died. This appears to be a significant difference; however, the number of treated cases is small, and the control series is not beyond some criticism. The death rate in the nonserum cases is high, which is not unusual in certain epidemics of lobar pneumonia among the class of patients treated in a charity institution, such as the Ancker Hospital. Charts are presented showing the cases treated by serum and the nonspecifically treated cases arranged in age groups, analysis as to death rate in the four types of pneumococcic infection, the blood culture observations, and the time relationship between the onset of the pneumonia and the first dose of serum. The cases are analyzed as to the relationship of the time of onset to the time of hospitalization and a fourfold table for the forty-eight cases treated with heterophile serum and the seventy-two control subjects less than 60 years of age is given. The best that can be hoped for serum therapy in the treatment of lobar pneumonia is a decrease in mortality. In this series, it was felt that at least half of the patients were definitely improved clinically following the therapy, but there has been no statistically proved decrease in mortality. The probability integral of 0.12 is encouraging (Chi square), and, if this or better probability figures can be shown in other similar series, the result would be considered encouraging. It is planned in the series now being studied to include determinations on the serum heterophile antibody in lobar pneumonia in treated and untreated cases.

New England Journal of Medicine, Boston

214: 665-714 (April 2) 1936

Rôle of Mental Hygiene in General Practice. C. Stein, Palmer, Mass.—p. 665.

Urologic Complications in General Surgery. G. G. Smith, Boston.—p. 672.

Foreign Bodies in Air and Food Passages. J. A. Coyle and L. K. Sycamore, Hanover, N. H.—p. 677.

Care of the New-Born. R. S. Eustis, Boston.—p. 681.

Study in Feigned Murder. J. W. Battershall, Attleboro, Mass.—p. 686.

The Golden Age of Medical Endowments. H. A. Christian, Boston.—p. 688.

214: 715-762 (April 9) 1936

Development of Neutralizing Substance for Poliomyelitis Virus in Vaccinated and Unvaccinated Individuals. W. L. Aycock, Boston, and C. C. Hudson, Greensboro, N. C.—p. 715.

Common Occurrence of Serious Involvement of the Heart in Hyperpiesia: Note. P. D. White, Boston.—p. 719.

Radiologic Management of Cancer of the Breast. R. Dresser, Boston, and V. A. Pelletier, Norwood, Mass.—p. 720.

Duodenal Stump Closure in Gastric Resections with Modified Furniss Clamp. H. M. Clute, Boston.—p. 724.

*Recrudescence of Ovarian Function After Heavy Irradiation: Two Cases. G. Van S. Smith, Brookline, Mass.—p. 725.

Benjamin Shattuck of Templeton: Medical Practitioner. G. C. Shattuck, Boston.—p. 727.

*Does Modified Measles Confer Lasting Immunity? J. H. Townsend, Boston.—p. 732.

Recrudescence of Ovarian Function After Irradiation.—Smith cites the cases of two women in whom periodic uterine bleeding occurred after truly large doses (a total of 6,000 and 5,400 mg. hours, respectively) of radium, and from whom functioning endometrium was obtained, indicating a return of ovarian activity. The first patient may have had ectopic ovarian tissue or a granulosa cell tumor, but this seems unlikely since she responded so well to a second treatment, remaining symptom-free thus far for three years and eight months. The diffuse enlargement of her uterus at the time of the second treatment, on the other hand, suggests the presence of a granulosa cell tumor. If the other patient had ectopic ovarian tissue, a return of function (amenorrhea for seven years) would have been expected sooner. The fact that her menstruation has been normal since reestablishment is on the whole against the presence of a granulosa cell tumor, although one such case has been encountered at the author's clinic. The finding of an endometrium showing the corpus luteum effect does not bear any weight for or against granulosa cell tumor, since secretory endometrium has been found in patients with these tumors when no other source of progestin could be demonstrated. Hormone studies of recent years have cast doubt on the concept that ovaries are endowed at birth with their full quota of primordial follicles and suggest that follicles may be developed from the ovarian stroma in extra-uterine life. The fact that the second patient had a secretory endometrium after so long a period of amenorrhea may be interpreted as evidence for the evolution of a new crop of primordial follicles. It does not seem at all likely that any follicles which might have survived irradiation would have remained inactive for so long a time. Only one biopsy of the endometrium was made from the first patient and it did not show any corpus luteum effect; therefore no deductions can be drawn as to whether follicles may have developed anew.

Modified Measles and Immunity.—In February 1926 Townsend gave thirty-two boarding school students 9 cc. of convalescent whole blood at least eight days before the development of the rash. They experienced distinctly milder symptoms than their confrères who were not so treated. Replies have recently been received from the thirty-two individuals. In no case have any of them experienced a subsequent attack of measles. Nine individuals indicated that they had, to their knowledge, come into intimate contact with the disease, some of them several times. Five others stated that they had been present in communities while measles epidemics had been in progress but did not know of direct contact. The others made no observations about possible exposures, but most of them

were in school or college for about six of the ten years, and probably had ample opportunity for exposure. There is no evidence to date that the active immunity conferred by modified measles is any less satisfactory than that conferred by the unmodified disease.

Psychiatric Quarterly, Albany, N. Y.

10: 193-360 (April) 1936

Place of Psychiatry in Criminal Law. W. Overholser, Boston.—p. 197.
Trends in Psychiatric Research. C. O. Cheney, New York.—p. 224.
Some Psychiatric Aspects of Marijuana Intoxication. P. H. Drewry, White Plains, N. Y.—p. 232.
Complement Fixation Test for Syphilis Applied to Oxalated Blood. H. S. Gregory, Binghamton, N. Y.—p. 243.
Marital Status in Relation to Prevalence of Mental Disease. B. Malzberg, Albany, N. Y.—p. 245.
Psychology of Manic Phase of Manic-Depressive Psychoses. J. R. Blalock, New York.—p. 262.

Public Health Reports, Washington, D. C.

51: 363-410 (April 3) 1936

Changes in Incidence and Fatality of Smallpox in Recent Decades. A. W. Hedrich.—p. 363.
Acute Response of Guinea-Pigs to Vapors of Some New Commercial Organic Compounds: IX. Pentanone (Methyl Propyl Ketone). W. P. Yant, F. A. Patty and H. H. Schrenk.—p. 392.

Southern Medical Journal, Birmingham, Ala.

29: 339-444 (April) 1936

Carcinoma of Rectum and Colon. D. F. Jones, Boston.—p. 339.
*Abdominal Lymphoblastoma and Its Treatment by Irradiation. A. U. Desjardins and C. H. Watkins, Rochester, Minn.—p. 344.
Gastro-Intestinal Malignancies: X-Ray Findings. J. T. McKinney, Roanoke, Va.—p. 351.
Monocytic Leukemia Cutis: Report of Case with Biopsy Studies. A. B. Loveman, Louisville, Ky.—p. 357.
Low Back Injuries, with Particular Reference to Part Played by Congenital Abnormalities. F. D. Dickson, Kansas City, Mo.—p. 364.
Bone Syphilis. J. S. Speed and H. B. Boyd, Memphis, Tenn.—p. 371.
Ectropion: Problem for Eye Surgeons. J. M. Wheeler, New York.—p. 377.
Some Sinus Conditions with Unique Symptoms. T. W. Moore, Huntington, W. Va.—p. 382.
*Some Biochemical Factors of Heart Failure. G. Herrmann, G. M. Decherd Jr. and E. H. Schwab, Galveston, Texas.—p. 386.
Pathogenesis of Circulatory Failure. T. R. Harrison, Nashville, Tenn.—p. 394.
Disorders of Heart Beat and Cardiac Failure. F. N. Wilson, Ann Arbor, Mich.—p. 397.
Treatment of Congestive Heart Failure. J. E. Paullin and W. R. Minnich, Atlanta, Ga.—p. 400.
Cardiac Neuroses. W. R. Houston, Austin, Texas.—p. 404.
Evaluation of Relative Rôle of Fungi (Trichophytin) and Other Allergens in Patients with Allergic Dermatoses. Edna S. Pennington, Nashville, Tenn.—p. 407.
Intravenous Testing in Postarsphenamine Dermatitis. H. M. Robinson, Baltimore.—p. 411.
Favorable Influence of Adequate (Higher) Carbohydrate Diets on Blood Pressure of Diabetic Patients. W. D. Sansum, Santa Barbara, Calif.—p. 414.
Some Observations on Anemia of Pregnancy. E. D. Plass, Iowa City.—p. 417.
Medical Supervision of Summer Camps. W. L. Funkhouser, Atlanta, Ga.—p. 422.
Tuberculosis as Public Health Problem Today. A. E. Russell, Washington, D. C.—p. 428.
Francis Adams of Banchory. L. J. Moorman, Oklahoma City.—p. 435.

Abdominal Lymphoblastoma and Its Treatment by Irradiation.—Desjardins and Watkins point out that many physicians have the impression that the manifestations of Hodgkin's disease and lymphosarcoma, especially the enlargement of lymph nodes, always begin in the neck and thence extend to the mediastinum, axilla, abdomen and groin. This is often true, but in some cases the disease first affects the abdominal, mediastinal or inguinal nodes and later spreads to other groups of nodes. Enlargement of retroperitoneal nodes, especially those around the celiac axis, as the earliest manifestation of the disease, is much more common than is generally realized. But even when the disease begins in the neck, axilla or mediastinum it tends to invade the retroperitoneal nodes sooner or later. The presence of Hodgkin's disease or lymphosarcoma in the retroperitoneal nodes usually is accompanied by more or less telltale symptoms. Pain is not a common complaint. Abdominal discomfort may be associated with nausea and irregularly with vomiting, or increasing constipation with an increasing tendency to distention with gas, or both. The patient may complain of pain in the back on one or both sides, and the pain may extend to one or both hips and sometimes down one or both lower extremities. Sometimes pain in a lower extremity may be accompanied by edema attributable to enlargement of the iliac and inguinal nodes; when this occurs, it is usually in association with involvement of the retroperitoneal nodes. By themselves these symptoms are not conclusive; the most significant feature is their slow, gradual increase. Two symptoms, which are of great diagnostic importance when present but which are lacking in many cases, are fever and pruritus. Concerning the technic of irradiation for lymphoblastoma, some divergence of opinion still exists. Impressed by the immediate recession of lymphadenopathy when the affected regions are exposed to rays generated at 200 peak kilovolts, some physicians are not aware that equal or better results may be obtained with rays generated at 135 peak kilovolts and filtered through 4 or 6 mm. of aluminum, according to the situation of the nodes. Since the disease tends to extend from one group of nodes to another regardless of the technic of irradiation, it is wise to adopt a technic that can be repeated at intervals for an indefinite period. Maximal doses are to be avoided because of the danger of inducing cutaneous or other changes which may shortly prevent subsequent treatment. In lymphoblastoma and certain other neoplastic processes in which it is essential to include all the lymph nodes from the diaphragm down to and including the groin, this can be accomplished much more effectively by dividing the anterior aspect of the abdomen (from xiphoid cartilage to groin) into four fields with the navel as a center, and by dividing the posterior aspect into four additional and corresponding fields. The several beams of rays should be made to converge toward the median line, where most of the nodes are situated. Thus, not only are the abdomen and its contents more uniformly irradiated, but the effect of many converging beams of rays on the lymphoblastomatous process and its clinical manifestations is much greater than when only one anterior and one posterior field are exposed. In women who still menstruate irradiation of the pelvis should be avoided, unless marked lymphoblastomatous infiltration of the iliac nodes or of some of the pelvic structures should force the physician to disregard menstrual function. Not only the obviously affected regions but all the more important groups of lymph nodes should be systematically irradiated. The treatment should be repeated at regular intervals of three or four weeks (unless pronounced leukopenia should prevent) until the lymphadenopathy has disappeared or until maximal regression of the enlarged nodes has been obtained. Even after apparently complete regression of the nodes, it is wise to give at least one more course of treatment. Only thus may prolonged arrest of the disease and improvement in the condition of many patients be expected.

Some Biochemical Factors of Heart Failure.—In addition to the chemical studies of human heart muscle, Herrmann and his associates have carried out various experimental procedures on several series of mammalian hearts and then analyzed the muscle. The total creatine content has been the object of most of their chemical analyses. The clinical experimental biochemical facts seem to point the way toward the ultimate solution of the problem of myocardial weakness or heart failure. The most logical deduction from the mass of data concerning the physical mechanism of heart failure and ten years of clinical and experimental work led Harrison to the conclusion that the chief factor in heart failure is anoxemia, an actual reduction of the diffusion of oxygen into the heart muscle cell. The thickened heart muscle cell of compensatory hypertrophy in itself impedes oxygen diffusion; the arteriolar and arterial sclerosis add some further barrier to maximal and adequate oxygenation. These factors alone lead to an anoxemia of heart muscle, and this in turn may initiate a train of chemical changes that further impair the functional capacity of the heart. The effect of inadequate cellular oxygen supply on cellular metabolism is that the synthesis of muscle glycogen is interfered with, the lactic acid that results from glycogen breakdown during contraction is not completely resynthesized and accumulates, and an acidosis results as the organic acid uses up the buffers of the blood. The phosphocreatine breakdown to creatine and phosphate liberates the energy of contrac-

tion even under anaerobic conditions, but the fairly constant relationship of aerobiosis is lost and the phosphocreatine disappears more rapidly than the glycogen, and the ratio falls. The increasing p_H likewise speeds up the velocity of phosphocreatine hydrolysis, and this may well hold the concentration at a low level and interfere with resynthesis and thus contribute to myocardial weakness. The potassium ion of the creatine phosphoric acid secondary salt may be lost under the conditions of anoxemia. The resynthesis of the phosphocreatine after the contraction apparently depends on the energy liberated by the delayed lactic acid formation. Some lactic acid is oxidized to carbon dioxide and water, but in anoxemia there is a rapid accumulation of lactic acid in the tissues and the blood, and the mammalian heart does not tolerate any concentration above 0.07 Gm. per hundred cubic centimeters without showing signs of exhaustion. The analysis of such exhausted hearts shows striking losses in total creatine content. It is therefore reasonable, in view of the facts known about the relation of phosphocreatine to cardiac energy, to consider heart failure a matter of disturbed glycogen-phosphocreatine metabolism.

Southwestern Medicine, Phoenix, Ariz.

20: 123-160 (April) 1936

Urinary Lithiasis. H. C. Bumpus Jr., Pasadena, Calif.—p. 123.
Congenital Valve of Posterior Urethra: Case Report. A. W. Multhauf, El Paso, Texas.—p. 125.
Treatment of Congestive Heart Failure. C. T. Stone, Galveston, Texas.—p. 126.
Diverticulum of Third Portion of Duodenum: Case Report. W. Smith, introduction by W. W. Watkins, Phoenix, Ariz.—p. 130.
Submucous Fibroids. L. Green, El Paso, Texas.—p. 132.
I. Rickets and Scurvy in Well-Nourished Child: Case Report: II. Imperforate Esophagus: Case Report. C. P. Harris, El Paso, Texas.—p. 133.
Studies on Nature of Phagocytosis. Z. M. Flinn, Prescott, Ariz.—p. 134.
Medicine and Men: Discussion of Compulsory Sickness Insurance. F. E. Sondern, New York.—p. 137.

United States Naval Med. Bulletin, Washington, D. C.

34: 149-284 (April) 1936

Drunkenness: Naval Medicolegal Aspects of Diagnosis. W. W. Hall.—p. 149.
*Dentin Desensitization. L. L. Hartman.—p. 163.
Treatment of Acute Mechanical Intestinal Obstruction. M. D. Willcutts.—p. 163.
Fracture of Carpal Scaphoid. F. R. Hook and J. D. Boone.—p. 172.
Study of Diet in Relation to Dental Caries Activity in Two Hundred and Twelve Enlisted Men at the Pearl Harbor, Submarine Base, Hawaii. Martha R. Jones and G. N. Crosland.—p. 181.
Differential Diagnosis of Coronary Artery Disease. E. A. Stephens.—p. 199.
Transportation of Insane Patients from Mare Island, Calif., to Washington, D. C. Alma C. Smith and A. S. Chrisman.—p. 204.
Blood Transfusion: Modification of Existing Devices. J. E. Reeves.—p. 210.
Studies of Active Pneumococcus Immunity: IV. Duration of Types I and II Pneumococcus Immunity. D. Ferguson.—p. 213.
Breathing Resistance of New Submarine Escape Apparatus Compared with That of Previous Models. R. A. Hansen, A. R. Behnke and C. W. Shilling.—p. 220.
Some Aspects of Treatment of Neurosyphilis in Navy. L. E. McDonald. p. 224.
Gonorrheal Infections in Samoa. B. Hollander.—p. 235.

Dentin Desensitization.—The painful reaction of dentin to operating procedures led Hartman to believe that it was probably due to the presence of lipoids in this tissue. Working on this assumption, he prepared a solution containing the lipoid solvents, alcohol and ether, and thymol, a substance soluble in lipoids. The formula (one and one-fourth parts of thymol, one part of 95 per cent ethyl alcohol and two parts of sulfuric ether) has been found effective in relieving pain during operations on dentin. The solution should be kept in a tightly corked brown glass bottle. Half an ounce of the solution is sufficient for 200 applications. Only cork or tin lined stoppers should be used. It is applied topically. The cavity is packed with dry cotton and a pellet of cotton is moistened in the liquid and held in contact with the cotton in the cavity for one minute in children and one and one-half minutes in adults. Both pellets are removed. Warm air is used to leave a film of thymol on the surface of the cavity. If applied over caries, a second application may be necessary after the caries has been removed.

Virginia Medical Monthly, Richmond

63: 1-64 (April) 1936

Surgical Treatment of Ulcerative Colitis. H. H. Trout, Roanoke.—p. 1.
Results of Roentgen Treatment of Some Very Advanced Malignancies. F. M. Hodges, Richmond.—p. 5.
Some Observations on Surgical Treatment of Pulmonary Tuberculosis. W. E. Brown and F. B. Stafford, Charlottesville.—p. 10.
Salient Points in Emergency Surgery. M. H. Todd, Norfolk.—p. 15.
Immediate Care of Perforations of Globe: Observations in Seventy-Two Cases. E. G. Gill, Roanoke.—p. 26.
Supposed Analogy Between Hyperthyroidism and Peptic Ulcer. E. T. Trice, Richmond.—p. 27.
Unusual Indications for Cesarean Section. C. J. Andrews and R. B. Nicholls, Norfolk.—p. 33.
Tetanus: Group Case Study. N. Bloom, Richmond.—p. 38.
Detailed Study of One Hundred Consecutive Cases of Allergy as Evidenced by Asthma and Hay Fever. K. D. Graves, Roanoke.—p. 42.

Western J. Surg., Obst. & Gynecology, Portland, Ore.

44: 199-254 (April) 1936

Gonadotropic Hormones. H. Evans, Berkeley, Calif.—p. 199.
Progress in Neurosurgery During the Past Twenty-Five Years. G. W. Swift, Seattle.—p. 209.
Achievements in Surgical Treatment of Lesions of Stomach and Duodenum During the Past Twenty-Five Years. V. C. Hunt, Los Angeles.—p. 218.
Modified Method of Billroth I Stomach Resection. M. E. Steinberg, Portland, Ore.—p. 222.
Advantages of Sodium Evipal as an Anesthetic Agent. F. M. Findlay, Santa Barbara, Calif.—p. 225.
*Diphtherial Infection of Scirrhous Carcinoma. W. Marshall, C. D. Neidhold and V. F. Marshall, Appleton, Wis.—p. 230.

Diphtherial Infection of Scirrhous Carcinoma.—Marshall and his associates report the case of a woman, aged 57, who noticed that the nipple of the left breast began to harden about one and a half years before. She stated that the area of the breast just superior to this nipple "turned in" and formed a "pimple" which did not open for a period of three or four months. It finally opened during January 1934. Since that time it had been draining slightly. The discharge was serous in type. There never had been any pain connected with the lesion. However, it did itch. A smear was taken from the sinus and a culture was made. The examination suggested a "diphtheroid" type of organism. A guinea-pig was innoculated with a culture and died within forty-eight hours. The necropsy revealed hemorrhages into the adrenals. The technician obtained a pure culture from a Loeffler's slant. These bacteria were gram-positive and were beaded and exhibited clubbed ends. Furthermore, they exhibited the peculiar pallisade arrangement or "hen's tracks." The necropsy observations of the injected guinea-pig were typically those caused by the Klebs-Loeffler bacilli. Several days later, cultures were taken from the patient's nose and throat. They did not exhibit this type of organism. Repeated cultures of the nose and throat gave the same results. The intracutaneous tuberculin test was positive within twenty-four hours. The control on the opposite arm was negative. The Schick test was negative, as was the control. The diagnosis was scirrhous carcinoma of the breast with secondary infection. The entire left breast was removed by the Willy-Meyer technic. It was atrophic and had very little glandular tissue remaining. There were some lipoid strands in the sclerosed tissue of the breast. The skin was heavily infiltrated with scirrhous carcinoma, and under examination exhibited the typical "pigskin" appearance. The axillary glands contained metastatic tumor growths, and cancerous proliferations were noted in the axillary regions and involved the underlying musculature and blood vessels. The pathologic diagnosis was scirrhous carcinoma of the breast with metastases to the lymph glands. As the patient improved from the operation, three doses of roentgen therapy, totaling 1,300 roentgen units, were given the left chest and neck regions. Some days later the area on the left breast, which was without skin, was covered with skin transplants (Thiersch grafts). These grafts grew well. In the course of about two weeks the patient was discharged from the hospital. However, a few months later, she began to experience symptoms which pointed to metastases to the brain and the skeletal system and she died within a period of six months. The patient may have been a carrier of the Klebs-Loeffler organism or she may have inocculated her breast with the pathogen.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Dermatology and Syphilis, London

48: 113-172 (March) 1936

The X-Ray Epilation of the Scalp. H. T. Schreus and A. Proppe.—p. 113.
Etiology of Erythema Nodosum. L. Forman.—p. 123.
Gold Dermatitis with Hyperkeratosis: Case. A. C. Roxburgh, A. P. M. Page and D. Gordon.—p. 137.

British Journal of Radiology, London

9: 143-214 (March) 1936

Ventriculography. M. H. Jupe.—p. 147.
*Protection of Radium Workers from Gamma Radiation: Protection Afforded by Building Materials. G. W. C. Kaye, G. E. Bell and W. Binks.—p. 161.
Fungoid Conditions of the Lung: Part I. R. Fawcitt.—p. 172.
Present Position of Treatment in Carcinoma of Cervix Uteri. T. F. Todd.—p. 196.
Neck of Femur from Lateral Aspect. C. E. Gaitskell.—p. 205.

Protection from Gamma Radiation Afforded by Building Materials.—Kaye and his co-workers deal with the part which building materials can play in providing protection against gamma rays for workers and others in the vicinity of radium bombs. Transmission measurements were conducted with narrow beams and with wider beams under everyday conditions, in which the influence of scattered radiation is almost always pronounced. The materials tested were full-scale walls of brickwork from 4 to 23 inches thick and solid steel doors up to 3½ inches thick, as well as smaller specimens of lead, iron, aluminum, brick, coke breeze and concrete of various thicknesses. Up to several grams of radium was used as a source of radiation, and the transmission measurements were made by means of thick air-walled ionization chambers, so as to simulate the conditions relating to deep seated tissue. It is customary to regard the absorption of gamma rays by different materials as proportional to their densities, but the present results show that, while the relationship is sufficiently exact for the lighter elements, it requires correction when comparing light and heavy elements, owing to photo-electric absorption in the latter. Protective values are commonly quoted in terms of lead, but when these are translated into terms of building materials, by the aid of the density law, the thicknesses so derived should be increased by up to about 50 per cent for the radium beam from a typical present-day bomb.

British Journal of Urology, London

8: 1-104 (March) 1936

Traumatism of Kidney: Report of Twenty-Seven Cases: Experimental and Clinical Study. W. C. Stirling.—p. 1.
Polycystic and "Unilateral" Polycystic Kidney: Review of Literature and Two Cases, One with Intracystic Papilloma. C. Wells.—p. 22.
*Relation of Parathyroid Glands to Urinary Lithiasis. J. D. Barney and E. R. Mintz.—p. 36.
Treatment of Prostatic Hypertrophy with Male Hormone (Hombreol). D. Van Cappellen.—p. 45.

Relation of Parathyroids to Urinary Lithiasis.—Among 340 patients with urinary lithiasis, Barney and Mintz discovered twelve cases, 4.16 per cent, of hyperparathyroidism proved by operation. Several other cases in which the observations were suggestive may be so affected. They believe that the studies being made of parathyroid disease in its relation to urinary stone may lead eventually to the solution of a great problem. The study of the subject of urinary lithiasis, whether due to hyperparathyroidism or to other causes, is not to be considered ended with the removal of the parathyroid tumor, of the stone or of both. There should be frequent follow up of the patients. A careful dietary regimen should be laid out; blood and urine chemistry should be frequently investigated; the urine should be kept strongly acid, preferably with ammonium chloride, and roentgenograms of the urinary tract should be taken from time to time. Only then will it be possible to put these investigations on a foundation of certainty. While hyperparathyroidism is responsible for between 4 and 5 per cent of all cases of urinary stone, the proportion of stones in the presence of this disease may be almost 70 per cent. Patients may show pathologic changes of bone and the urinary tract in about 38 per cent of cases of hyperparathyroidism. This disease does not seem to be a factor in the production of bilateral lithiasis. The symptoms and signs of urinary lithiasis in parathyroid tumors do not differ from those due to other causes.

British Medical Journal, London

1: 401-456 (Feb. 29) 1936

Recent Advances in Radium Therapy. H. S. Souttar.—p. 401.
Mycotic Infections and Their Treatment. J. C. Belisario.—p. 404.
Some Toxemias of Animals Due to Anaerobic Organisms: Comparative Pathologic Study of Recent Work, with Particular Reference to Toxemia of Intestinal Obstruction in Man. H. A. Woodruff.—p. 406.
Chronic Rheumatism. R. F. Fox.—p. 409.
Malignant Endocarditis Due to Brucella Abortus. J. K. Rennie and C. J. Young.—p. 412.
Belladonna Poisoning by Liquid Extract of Liver. N. F. Winder and C. H. Manley.—p. 413.

East African Medical Journal, Nairobi

12: 325-356 (Feb.) 1936

Inquiry into Correlation of Civilization and Mental Disorder in the Kenya Native. H. L. Gordon.—p. 327.
Cinchona Alkaloids in Treatment of Malaria: Notes. R. Mackay—p. 336.
*Cod Liver Oil Treatment of Wounds. J. H. Tennent.—p. 341.
Bug Proof Construction of Native Dwellings. F. Walker and D. S. Dixon.—p. 344.
Congenital Relapsing Fever: Case. H. G. Calwell.—p. 347.

Cod Liver Oil Treatment of Wounds.—Tennent has used cod liver oil in the treatment of a varied series of wounds. The method is comparatively painless; it is efficient, results in a great reduction in the number of dressings required, and is simple and cheap. The one disadvantage is the characteristic odor, but in none of the author's cases has the odor been an insuperable difficulty. He briefly refers to three of his most striking cases: a severe burn, an accidentally opened knee joint and a wound from a charge of shot at close range in the right buttock. Treatment with cod liver oil has given most gratifying results, confirming those of Steel.

Edinburgh Medical Journal

43: 125-216 (March) 1936

Series of Nephrectomies for Tuberculosis: Notes. R. C. Alexander.—p. 127.
Inoculation Tuberculosis: Report of Unusual Case. J. Anderson.—p. 132.
Some Points in Histologic Diagnosis of Tuberculosis. D. F. Cappell.—p. 134.
Avian Type Tubercle Bacillus: Its Characteristics, Cultural and Pathogenic, with Demonstration of Natural Disease Produced by Bacillus. W. J. Tulloch.—p. 144.
Rôle of BCG in Vaccination of Cattle Against Tuberculosis. J. B. Buxton.—p. 160.
Practical Application of BCG Vaccine in Prophylaxis of Tuberculous Infection in Children. E. Rist.—p. 172.
Experimental Study on Allergy and Immunity. D. G. S. M'Lachlan.—p. 185.
Id.: Preliminary Report of Early Observations. C. Clayson.—p. 185.
Lupus Vulgaris, with Especial Reference to Its Treatment with Finsen-Lomholt Lamp. R. Aitken.—p. 194.

Indian Medical Gazette, Calcutta

71: 61-120 (Feb.) 1936

*Bacteriophage in Treatment of Cholera. C. L. Pasricha, A. J. H. de Monte and E. G. O'Flynn.—p. 61.
Against Orthodoxies in Rabies. S. D. S. Greval.—p. 69.
Epithelioma Adenoides Cysticum: Reports of Three Cases. A. N. Goyle, K. G. Krishnaswami and A. Vasudevan.—p. 74.
Petit Mal or Pyknolepsy. J. N. Pacheco.—p. 77.
Practical Way of Dealing with Aedes Aegypti (Stegomyia Fasciata) Mosquito Breeding in Country Craft. F. D. Bana.—p. 79.
Unusual Source of Contamination of Well Water: Note. T. N. S. Raghavachari.—p. 80.

Bacteriophage in Treatment of Cholera.—Of 1,369 patients with cholera admitted during the year ended July 1935, Pasricha and his associates treated 684 with choleraphage, while 685 received the usual hospital treatment. The selection was made by taking alternate admissions into the wards, irrespective of age, severity and general condition of the patient. Both series received the usual hospital routine treatment for cholera, and the phage-treated patients received in addition choleraphage in doses of 2 cc. every four hours. The only medication given orally was in the form of divided doses of mercury bichloride. Every patient was examined bacteriologically on the day of admission. Later, examinations were made at least once in every twenty-four hours, up to the complete dis-

appearance of symptoms, and when possible a certain number of cases were followed up after discharge from the hospital. Special efforts were made to examine repeatedly cases clinically positive but bacteriologically negative. Choleraphage used for treatment was prepared on freshly isolated agglutinable strains and constantly "refreshed" on recently isolated vibrios. Freshly isolated potent phages were frequently added to the "seed phages" and every effort was made to ensure the presence of a larger number of types of choleraphage in each brew. The only criterion of the results of treatment employed has been recovery or death. The gross mortality is less, though not statistically significant, in the cases treated with choleraphage. The difference in the mortality rates between the series is more marked during the period when the cases treated with choleraphage were in a separate ward. In cases of clinical cholera in which vibrios were isolated, bacteriophage is of definite therapeutic value. Of the total number of 398 patients with cholera passing vibrios in the series treated with the choleraphage, agglutinable vibrios were found in 337 cases, or approximately 85 per cent. The mortality in this group was 8.3 per cent. Of the 443 patients in the series not treated with the choleraphage, 369, or 83 per cent, were found to pass agglutinable vibrios. The mortality in this group was 20.6 per cent. The results in this group are statistically significant. Choleraphage gave unfavorable results in the cases in which, in spite of repeated search, only inagglutinable vibrios were found. The mortality in this group (sixty-one cases) was 8.2 per cent, as compared with 4.7 per cent in the control series (seventy-four cases). No satisfactory explanation can be advanced for this failure. However, the choleraphage used in the experiment had been propagated only on agglutinable vibrios. The effect of bacteriophage prepared on inagglutinable vibrios, or a therapeutic bacteriophage prepared on both agglutinable and inagglutinable vibrios of a particular epidemic, still remains to be determined. There is an appreciable difference in the treated and control series of cases. The patients are less toxic, there is less dehydration, and fewer injections of sodium chloride solution are required in the treated series than in the controls; also the patients are discharged sooner, secrete vibrios for a smaller number of days and in general have a clinically milder course. Uremia and other complications are often averted, or, if they supervene, are milder in the treated series.

International Journal of Psycho-Analysis, London

17: 1-142 (Jan.) 1936

A Note on Suicide. Melitta Schmideberg.—p. 1.
Purposive Accidents as an Expression of Self-Destructive Tendencies. K. A. Menninger.—p. 6.
Infantile Ideals. M. N. Searl.—p. 17.
Dominant Ideas and Their Relation to Morbid Cravings. Therese Benedek.—p. 40.
Psychology of the Festival of Christmas. L. Jekels.—p. 57.
Unconscious Significance of Hair. C. Berg.—p. 73.
The Problem of Freedom in Psychoanalysis and the Problem of Reality Testing. R. Wälder.—p. 89.

Irish Journal of Medical Science, Dublin

No. **122:** 49-96 (Feb.) 1936

The Commonwealth of Medicine: Yesterday. W. R. Fearon.—p. 49.
*Generalized Osteitis Fibrosa Cystica. W. J. E. Jessop.—p. 59.

Generalized Cystic Fibrotic Osteitis.—Jessop says that in generalized cystic fibrotic osteitis there is hyperactivity of the parathyroids associated with hyperplasia and resulting in the production of excessive secretion. Under the influence of this excess parathyroid hormone calcium salts are mobilized from the bones, which consequently suffer loss in strength as shown by deformity and spontaneous fracture. There is lack of density in the shadows with localized cyst formation. The bone is replaced by fibrous tissue. There is considerable osteoporosis, and the arrangement of the osteoclasts and osteoblasts affords evidence of absorption and new bone formation. These two processes often proceed in an irregular manner and the new bone rarely shows a normal arrangement in haversian systems. The amount of calcium in the blood increases and there is increased excretion of calcium salts, especially in the urine. The necessity for maintaining osmotic equilibrium in the kidney leads to polyuria, which is accompanied by thirst. The effort on the part of the organism to bring about a compensatory increase in new bone formation leads to an increase of the concentration of phosphatase in the plasma. The concentration of calcium in the plasma is known to control the tone and excitability of muscle. In parathyroid tetany the diminished blood calcium is accompanied by increased muscle tone and muscular hyperexcitability, and a return to normal follows intravenous injection of calcium chloride in sufficient quantity to restore the blood calcium to normal level. Similarly, continued injection of parathyroid extract produces an increase in blood calcium and a state of diminished tone and excitability in muscle. The increased blood calcium in cases of parathyroid tumor (generalized fibrotic osteitis) is frequently accompanied by like muscular changes, which are corrected by the removal of the (parathyroid) tumor. Certain other clinical features are of interest. The disease is most common in women between the ages of 30 and 60 years and is often accompanied by weakness and loss of weight and a hypochromic anemia. During the course of the disease there is often much pain and tenderness in the bones or joints. Pronounced changes are found in the skull, which becomes enlarged, with prominence of the forehead. The total number of cases at present recorded is variously estimated at between fifty and 100, but the higher figure probably includes many in which the parathyroid enlargement was found post mortem and others in which slightly enlarged or normal parathyroids were removed from atypical cases.

Journal of Hygiene, London

36: 1-128 (Feb.) 1936

Measurement of Airway of Nose and Nose-Opening Rays. L. Hill.—p. 1.
Radiologic Demonstration of Bronchial Constriction in Acute Anaphylaxis in Guinea-Pig. R. Williamson.—p. 11.
*Iron in Human Nutrition. E. M. Widdowson and R. A. McCance.—p. 13.
Stock Diet for Rats. W. Thomson.—p. 24.
*Antistreptolysin Titers of Human Serum in Health and in Various Streptococcic Infections. R. D. Stuart.—p. 26.
Resistance of Four Mouse Lines to Bacterial Infection. H. Schütze, P. A. Gorer and M. H. Finlayson.—p. 37.
Application of Principle of Eijkman's Fermentation Test for Determining Coli Titer of Water. J. E. Minkevich, N. J. Alexandrov and E. J. Soboleva.—p. 50.
Comparative Investigation of Bulir's Fermentation Test at 43 C. and Standard American Test at 37 C. J. E. Minkevich, F. S. Joffe and A. J. Shafir.—p. 64.
Silicosis in Sand Blasters: Examination of Sands Associated with Sand Blasting. F. S. Fowweather.—p. 67.
Relation Between Health and Intelligence in School Children. N. J. England.—p. 74.
Trend of Cancer Mortality in Australia. J. H. L. Cumpston.—p. 95.
Contribution to the Problem of Virulence (VI) Antigen of Bacillus Typhosus. S. S. Dyachenko.—p. 108.
Biochemical Reactions of Vibrios. B. Heiberg.—p. 114.
Two Serologically Different Groups Among True Cholera Vibrios. B. Heiberg.—p. 118.
Pathogenicity of Tanganyika Strains of Brucella Abortus and Brucella Melitensis for Local Species of Monkey (Cercopithicus Sp.). D. E. Wilson.—p. 125.

Iron in Nutrition.—Widdowson and McCance assessed the total and "available" iron intakes of sixty-three men and sixty-three women of the English middle class, whose ages ranged from 18 to 90 years and who were living on freely chosen diets with no restrictions due to income or other cause. Their occupations were sedentary or moderately active; a few manual laborers were included. The mean intake of total iron for the men was 16.8 mg. a day; however, 37 per cent of the men were consuming a diet containing less than 15 mg. a day, and the minimum (7.8 mg.) was little more than half. The average intake of total iron for the women was 11.4 mg. a day, and 30 per cent of the women were taking less than 10 mg. of iron daily. The chief source of iron in the English diet is meat. The available iron intake for men had a mean value of 10.8 mg. a day. The corresponding figure for women was 7.9 mg. This higher percentage of total iron taken in an available form by the women is due to their lower intake of meat, which contains much total iron but relatively little available iron. Hemoglobin determinations were made on forty-two of the men and twenty-nine of the women. Mean values of 102 per cent for men and 93 per cent for women were obtained. These results must be considered to be within the normal range (Price-Jones, 1931). No correlation could be found among the women between the total or available iron intake and the percentage of hemoglobin in the blood. For the men the correlation was not significant for the total iron but was

just significant for the available iron. This does not prove that the intake of iron is not a factor in regulating the level of hemoglobin in the blood. It merely shows that under these conditions other factors involving absorption, excretion and menstrual loss predominate. The lower percentage of hemoglobin in women's blood must be due either to some physiologic cause or to the fact that their iron intake is insufficient for their requirements. A dietary cause should be sought for the lower hemoglobin levels in women. The effect of large doses of iron (100 mg. of iron a day as ferrous sulfate or ferric ammonium citrate) on normal hemoglobin levels scarcely altered the hemoglobin percentages of men but has increased the values for women by from 4 to 17 per cent, and a mean rise of more than 10 per cent has been observed.

Antistreptolysin Titers of Serum in Health and Infection.—Stuart compared streptolysin production by twenty-seven strains of hemolytic streptococci grown in a special buffered dextrose serum-free broth and observed a marked variation. The antistreptolysin titers in healthy individuals and in others at the commencement of illness showed a pronounced variation. Throat infections with Streptococcus haemolyticus usually produced a rise in the level of circulating antistreptolysin in the patients' blood, and this could be considered diagnostically significant. Throat infections with hemolytic streptococci showed rather more rapid production and higher titers of antistreptolysin than did skin infections, such as erysipelas, and both throat and skin infections were greatly superior to uterine infections in this respect. Neither the level of circulating antistreptolysin at the commencement of infection nor the rate and height of response could be shown to have any bearing on the severity of the disease, except that a poor antistreptolysin response was found in certain cases of relapses and toxic complications of throat infections. This appeared, however, to be merely indicative of a general poor antitoxic response and not to have any meaning by itself, except in certain arthritic cases in which the question of its importance was more open. No correlation was noted between antistreptolysin response and relapses and septic complications in erysipelas. In general the antistreptolysin response in infection appeared to depend more on the individual than on the site or severity of infection.

Journal of Physiology, London

86: 229-336 (March 9) 1936

Some Factors Influencing Survival of Rats After Adrenalectomy and Suitability of the Young Rat for Testing Potency of Adrenal Cortical Extracts. R. A. Cleghorn, S. M. M. Cleghorn, M. G. Forster and G. A. McVicar.—p. 229.
Effect of Pregnancy and Pseudopregnancy on Blood Lipoids of Rabbits. E. M. Boyd.—p. 250.
Potassium Changes in Stimulated Superior Cervical Ganglion. Marthe Vogt.—p. 258.
Respiration and Venae Cavae: Further X-Ray Cinematographic Studies. K. J. Franklin and R. Janker.—p. 264.
Transmission Through a Lumbar Sympathetic Ganglion. S. Obrador and J. B. Odoriz.—p. 269.
Acetylcholine Content of Cerebrospinal Fluid of Dogs. W. Feldberg and H. Schriever.—p. 277.
Response of Medullated Nerve to Alternating High Frequency Stimulation. B. Katz.—p. 285.
Action of Potassium on Superior Cervical Ganglion of the Cat. G. L. Brown and W. Feldberg.—p. 290.
Liberation of Acetylcholine by Potassium. W. Feldberg and J. A. Guimarãis.—p. 306.
*Effect of Diets Low in Choline. C. H. Best, M. Elinor Huntsman Mawson, E. W. McHenry and Jessie H. Ridout.—p. 315.
Gonadotropic Activity of Pituitaries of Vitamin E Deficient Rats. I. W. Rowlands and E. Singer.—p. 323.
Occurrence of Ovulation and Pseudopregnancy in Rabbit as a Result of Central Nervous Stimulation. F. H. A. Marshall and E. B. Verney.—p. 327.

Effect of Diets Low in Choline.—Best and his co-workers give further evidence that diets low in choline and other lipotropic factors result in the deposition of large amounts of neutral fat in the livers of white rats. There is also a small increase in the cholesterol ester fraction. The accumulation of glyceride is greatest when there are large amounts of fat in the diet, but it is observed also when there is less than the usual amount. The addition of choline to the diet inhibits the deposition of fat in the liver and the minimal effective dose of the base is less than 3 mg. per rat daily. When diets rich in fat are provided, choline appears to exert a favorable effect on the rate of gain in weight and general physical condition of the animals. The bearing of these results on the hypothesis that choline and other lipotropic factors are essential for certain liver functions is discussed.

Lancet, London

1: 463-520 (Feb. 29) 1936

Prophylactic Action of "Bayer 205" Against the Trypanosomes of Man: Concluding Observations. H. L. Duke.—p. 463.
Antagonism Between Curarine and Prostigmine and Its Relation to the Myasthenia Problem. Grace Briscoe.—p. 469.
*Rôle of Ultraviolet Rays in Development of Cancer Provoked by the Sun. A. H. Roffo.—p. 472.
Gonadotropic Hormones in Treatment of Sterility in Man. V. E. Lloyd.—p. 474.
Three Arterial Embolectomies in the Same Patient, Including One in Each Femoral Artery. H. I. Deitch.—p. 475.
Alcoholic Pseudoparesis: Case. E. W. Anderson.—p. 477.
Jaundice Due to Phenobarbital. C. A. Birch.—p. 478.

Rôle of Ultraviolet Rays in Development of Cancer.—Roffo states that among 5,000 cancer patients attending the Cancer Institute of Buenos Aires none showed cancer of any part of the skin covered by clothing (except in two or three cases in which tumors developed on nevi or burn scars). The parts of the face most often affected are those most prominent and exposed: the nose, the cheek and hardly any on the forehead. It is also found that men are more receptive (70.9 per cent) than women (29.1 per cent), the lower incidence in women being related to the care they take of their skin, protecting it with powder. Sufferers from epithelioma are generally found to have very white (photosensitive) skins, and the author has not seen a single case in natives, Negroes or mulattoes. The hyperkeratosis that leads on to the epithelioma is dominated by a photodynamic mechanism, and for fulfilment of the process the following factors are necessary: the living cell, a sensitizing photodynamic substance, the presence of oxygen and the rays of the sun. Experiments have been undertaken by the author that confirm this view. In white rats he has obtained tumors of different histopathogenesis (epitheliomas and spindle cell sarcomas) in unprotected parts of the skin (ears and ocular conjunctiva). These tumors have developed under the influence of the total sun rays or under ultraviolet rays with a wavelength of from 1,800 to 3,400 angstroms. In animals, as in human beings, the skin is found to have an abnormally high cholesterol content before the development of the tumors. Exposure to the sun's rays was in itself sufficient to produce malignant tumors in 70 per cent of the rats. The process takes from seven to ten months, passing through hyperplasia and papillomatosis, and the carcinomatous and sarcomatous animals alike die in a state of cachexia with metastases in lymph glands. Experiments performed with different rays show that the power of the rays to produce tumors depends on their actinic and not on their luminous intensity. Histologically, the lesions obtained closely resemble those observed in persons with photosensitive skins who have been much exposed to the sun. The observations emphasize the danger of such exposure.

Medical Journal of Australia, Sydney

1: 221-252 (Feb. 15) 1936

Traumatic Lesions of Knee Joint. J. S. MacMahon.—p. 221.
Internal Derangements of the Knee Joint. M. Callow.—p. 228.
*Neural Components of Teratomas. R. A. Willis.—p. 231.
Papuan Field Experiment of Malaria Treatment. F. W. Clements.—p. 235.

Neural Components of Teratomas.—Willis discusses the possible functional significance of some of the neural elements in teratomas. The healthy appearance of many of the nerve cells in the ganglions, and less frequently in the central neural tissue of teratomas, suggests that they may have been capable of functioning. It is therefore pertinent to ask whether the nerves in these tumors may not sometimes effect functional connections with other tissues and so influence their differentiation and growth in ways comparable to those obtaining in normal ontogeny. The first step in attempting to establish this view would be to demonstrate the presence of effector nerve endings in muscle fibers and glandular epitheliums; and this has not yet been done. Finally, it is emphasized that the neural tissues found in teratomas do not form an organized nervous system. The tissues are scattered and entirely unana-

tomic in topography, neurons are scanty or absent in much of the neuroglial patches, and tracts of nerve fibers are absent; ependymal cavities are irregular in distribution and shape and are often disconnected and multiple, and peripheral nerve bundles are usually single and never grouped together to form large nerves. It is important to insist on these points, since many writers have reported that they have seen parts or the whole of a brain or spinal cord in teratomas. Structures so frequently present as masses of central neural tissue must necessarily assume, at times, shapes capable of fitting into almost any preconceived molds.

Practitioner, London

136: 237-348 (March) 1936

Leukemia: Differential Diagnosis and Treatment. H. L. Tidy.—p. 237.
Status Thymicolymphaticus. H. Cohen.—p. 252.
Tuberculosis of Lymphatic Glands. E. P. Gould.—p. 262.
Hodgkin's Disease and New Growths of Lymphatic Glands. W. G. A. Swan.—p. 273.
Acute Lymphangitis and Acute Lymphadenitis. H. C. Edwards.—p. 281.
Pains About the Head and Neck. W. Harris.—p. 289.
Observations on Vertigo. S. Scott.—p. 302.
The Medical Examination of Boat Race Crews. C. M. Billington.—p. 310.
Ultimate Diagnosis of Anemia. G. E. Lewis.—p. 318.
Nutritive Value of Clear Soups. W. F. Christie.—p. 321.
Favorite Prescriptions: No. XV. Pharmacopeia of St. George's Hospital. H. Gainsborough.—p. 327.

Tubercle, London

17: 193-240 (Feb.) 1936

Tuberculosis of Eye. R. E. Bickerton.—p. 193.
*Vitamin D in Experimental Tuberculosis of Guinea-Pigs. J. Zeyland and E. Piasecka-Zeyland.—p. 198.
Some Indications for Paralysis of Diaphragm in Pneumothorax Treatment of Unilateral Pulmonary Tuberculosis. R. N. Tandon.—p. 203.
Significance of Sedimentation Rate, Blood Index, Pulse and Blood Pressure in Prognosis of Pulmonary Tuberculosis. K. S. Sanjivi and K. V. Rao.—p. 205.
Questionnaire on Complications Following Artificial Pneumothorax in Pulmonary Tuberculosis and Their Prevention by Collapse Therapy of Early Diagnosed Cases. F. Baum.—p. 212.

Vitamin D in Experimental Tuberculosis.—In order to determine the effect of small doses of vitamin D (corresponding to the doses used in clinical therapy) in the experimental tuberculosis of guinea-pigs, Zeyland and Piasecka-Zeyland performed experiments on two series of forty guinea-pigs of the same weight and age, infected subcutaneously with a dose of 0.05 mg. of bovine bacilli. In the first series of twenty guinea-pigs half of the animals after the infection received every second day one drop of a weak dilution of viosterol containing 25 international units; in the second series of twenty guinea-pigs half of the animals received every day two drops of a dilution of crystalline vitamin D containing 750 international units. By comparing the tuberculous involvement of treated and untreated animals it was possible to note a lack of convincing differences in both groups, with the exception of a slight and not essential prolongation of the life of the animals treated with vitamin D. Small doses of vitamin D corresponding to those used in the treatment of human beings, therefore, have no influence on the course of the experimental tuberculosis of guinea-pigs under the foregoing conditions.

17: 241-288 (March) 1936

Industrialism and Tuberculosis. E. L. Middleton.—p. 241.
Id. P. Heffernan.—p. 250.
Liberation of Intrapleural Adhesions with Thoracoscope. O. M. Mistal.—p. 256.
*Electrical Anesthesia: Simple Curative and Symptomatic Treatment of Painful Dysphagia in Tuberculous Laryngitis. R. Grain.—p. 261.
Morbid Histology of Pulmonary Abscess Cavity Walls. S. R. Gloyne.—p. 267.

Electrical Anesthesia in Treatment of Dysphagia.—Grain believes that electrical anesthesia has advantages over other therapeutic methods in the treatment of painful dysphagia in that it is simple in application, painless, harmless, never producing any local or general reaction, and giving positive results in from 98 to 99 per cent of cases of dysphagia. Electrical anesthesia, as used in the treatment of painful dysphagia, is a medical anesthesia that consists in eliminating in a localized territory the pain due to evolutive or avoluted lesions. These regional pains form the extensive class of peripheral algias. The electrical anesthesia has no appreciable and durable effect on truncular algias. It must be considered the treatment of only the algias of the nerve endings, on which it acts with remarkable efficiency. The anesthesia is obtained by iodide ionization of the larynx encircled with special electrodes. The ionization current is produced by a galvanic apparatus with a fine reducing coil working on 45-volt dry batteries or on accumulators capable of giving at least 15 milliamperes. As the current must be rigorously continuous, these sources are the only ones that can be used. The electrodes are made of unoxydable steel with a thickness of 0.5 mm. The anterior electrode is 75 mm. long and 35 mm. wide and the posterior electrode 100 mm. long and 35 mm. wide. The anterior electrode is placed in front of the larynx, and the posterior electrode on the nape of the neck. They are kept in position by a collar made of isolating thick rubber. The intensity of the current to be used is uniformly of from 10 to 12 milliamperes; the sittings last half an hour, or longer if necessary. The sittings are repeated daily until the duration of the anesthesia reaches twenty-four hours, after which they are repeated only when the pain reappears. There is no advantage in giving daily sittings once the anesthesia lasts forty-eight hours, as its progression is not influenced by the repetition. As soon as the current passes, the patient notices a sensation of stricture in the neck, and at the same time he has a taste comparable to that of ink or of copper. The sensation is accompanied by a slight amount of ptyalism. The sensation of stricture disappears in four or five minutes, while the metallic taste and the salivation persist during the treatment. Five or six minutes after the passage of the maximal current the patient notices a marked diminution of the pain on swallowing, which is reduced to a sensation of slightly disagreeable prickling, and at the same time the auricular irradiations disappear. After this beginning, the anesthesia increases rapidly and in about ten or fifteen minutes after the onset of the treatment it is absolute.

Chinese Medical Journal, Peiping

50: 1-96 (Jan.) 1936

Calcium and Phosphorus Metabolism in Osteomalacia: IV. Report of Unusual Case in Male with Acute Parathormone Poisoning. H. I. Chu, S. K. Chou, K. C. Chen, S. H. Wang, S. H. Liu and R. R. Hannon.—p. 1.
*Further Observations on Diagnosis of Amebic Dysentery. H.-C. Chang, K.-C. Ch'en and S.-K. Chou.—p. 17.
Milk in Treatment of Gonoblennorrhea. T. H. Luo.—p. 27.

Diagnosis of Amebic Dysentery.—Chang and his associates state that uncomplicated amebic dysentery is readily amenable to treatment. Drugs of recognized value seem to fulfil what has been claimed for them. But the success of treatment hinges entirely on an accurate diagnosis. For diagnosis, reliance has been heretofore placed entirely on the protozoological examination of the stool. In order to prevent error, even the most experienced protozoologists have insisted on a colossal number of examinations, which in actual practice is hardly practicable. To remedy this it is necessary to have a speedier and more accurate method of diagnosis to supplement, if not to replace, the fecal examinations. The authors believe that sigmoidoscopy admirably fills this need. The examination is simple and harmless and, with care, need not be unpleasant to the patient. By this method alone can one accurately observe the character of the lesion by direct vision, which in itself is often diagnostic. It ensures the most prompt detection of the causative ameba and thereby facilitates early treatment. It affords the best means of differentiation when the question of mixed infection or carrier state is at issue. It provides an accurate control of the treatment. The only drawback to sigmoidoscopic diagnosis is that in amebic dysentery theoretically the lesions may not be within the reach of the instrument. In amebic dysentery a number of questions still await answer. Among these may be mentioned the condition of the rectal mucosa in the so-called carrier state, the quantitative relationship between the lesion and the symptoms, and the comparative effect of different antiamebic preparations on the amebic ulcer. Sigmoidoscopy promises to be most helpful in unraveling these problems. An analysis of seventy-five cases of amebic dysentery and a summary of the sigmoidoscopic picture of fifty cases are presented.

Archives des Maladies de l'App. Digestif, Paris

26: 241-360 (March) 1936

Physiopathologic Study of Hematopoietic Part of Stomach. A.-C. Guillaume.—p. 241.
Hypertrophic Stenosis of Pylorus in Adult. E. Delannoy and G. Patoir.—p. 260.
Statistical Study of Chronic Angiocholecystitis: Three Thousand Cases. E. Binet.—p. 273.
*Graphic Studies on Action of Tobacco Smoke on Motility of Small Intestine in Man. D. Simici and M. Popesco.—p. 295.

Action of Tobacco Smoke on Small Intestine.—Simici and Popesco studied the motility of the small intestine in man by recording the peristaltic contractions of the jejunum and ileum by means of a duodenal sound and a small rubber ampule. This was attached in the usual manner to a kymograph and thus recorded. They concluded that inhalation of cigar or cigaret smoke produces in accustomed smokers as well as in nonsmokers an increase in the motility of the small intestine. It usually begins a few minutes after inhalation of the smoke. The phenomenon almost always lasts for a considerable period. It may persist for from thirty to sixty minutes after the act of smoking has been stopped. The intestinal hypermotility, which is produced by inhalation of tobacco fumes in nontoxic doses, is probably caused by the exciting action of substances in the smoke, which appear at the moment of combustion on the parasympathetic vegetative system of the intestine. The individual vegetative tonus appears to affect to some degree the intensity and duration of the response. Smoking of a tobacco filtered through a beaker containing a concentrated solution of 5 per cent hydrochloric acid loses almost entirely its property of influencing the motility of the small intestine.

Presse Médicale, Paris

44: 449-472 (March 18) 1936

Place of Microbial Germs in Asthma: Indications for Vaccinotherapy. Pasteur Vallery-Radot, P. Blamoutier and F. Nitti.—p. 449.
Diagnosis of Calculi of Kidney and Ureter in Childhood. Guilleminet and R. Gayet.—p. 451.
*Treatment of Erysipelas. A. Meyer-Heine and P. Huguenin.—p. 454.

Treatment of Erysipelas. — Meyer-Heine and Huguenin state that since the work of Mietzsch and Klarer in 1932 it has been known that 4-sulfamido-2-4 diamino-azobenzene has a remarkable action on experimental streptococcic infections. They report the action of this substance on a considerable number of patients having erysipelas of the face and of the limbs. In the majority of instances the subsidence of general symptoms and local signs occurred rapidly. This was especially true of erysipelas of the face. There were some failures but no complications of importance. In general, the hydrochloride of sulfamido-chrysoidine seems to bring about a shortening of the febrile period, causing the rapid disappearance of the cutaneous symptoms. The authors are especially impressed with the effectiveness of this treatment in erysipelas of nurslings. The mode of action of the substance is not well known, but the results seem to be undeniably good.

Schweizerische medizinische Wochenschrift, Basel

66: 329-348 (April 4) 1936. Partial Index

Urgent Surgical Indications in Recent Closed Traumatic Injuries of Cranium and Brain. F. Ody.—p. 329.
Fatality in Case of Brucella Abortus Infection After Accident. A. Werthemann.—p. 333.
*Superficial Keratitis and Vitamin A. F. Stocker.—p. 335.
*Fractional Blood Transfusion. A. Fonio.—p. 337.
Cerebral Tumor and Polyglobulism. E. Meiner.—p. 338.

Superficial Keratitis and Vitamin A.—Stocker says that in this report he applies the term superficial keratitis to superficial changes of the cornea, regardless of whether there is inflammation or not. After mentioning various etiologic factors, he points out that he was able to differentiate one group with a uniform etiology. The general condition of these patients is usually poor; they are emaciated, pale and nervous and complain of insomnia. The superficial epithelial lesions of the cornea are of various shapes and are usually located on the lower and lateral edges and on the lower quadrant. The local treatment gives as a rule only a temporary improvement. The fact that the general condition of these patients was poor suggested the possibility of a nutritional disturbance. Moreover, in view of the protective action of vitamin A on the epithelial cells and of the importance of vitamin A in xerophthalmia and keratomalacia, it was assumed that a deficiency in vitamin A might play a part in the described form of superficial keratitis, and several patients were treated with vitamin A. The result was not only that the local corneal changes disappeared but also that the general condition improved. Some of the patients remained free from relapse for a considerable length of time, but in others there were recurrences after cessation of the vitamin medication. To be sure, renewed administration of the vitamin counteracted the relapses again. Studies conducted to determine whether a carotene deficiency in the diet or a functional insufficiency of the liver is responsible for the A avitaminosis of the patients with superficial keratitis indicated not so much an insufficient intake but rather a defect in the utilization of the vitamin.

Fractional Blood Transfusion. — Fonio shows that the blood can be separated into its constituents: The erythrocytes can be preserved for six or seven days without hemolysis. The transfusion of the erythrocytes was well tolerated in two cases. The blood platelets can likewise be isolated and stored. However, in order to avoid the formation of agglutination, it is necessary to add a 30 per cent solution of sodium citrate. Before resorting to the transfusion of the platelets it is necessary to remove the largest part of the sodium citrate. The author suggests how this can be done but admits that as yet he has no practical experience with the transfusion of platelets. The third constituent of the blood, the plasma II, from which the blood platelets have been removed, cannot be stored for long. The author points out that with this separation of the blood into its constituents it is possible to administer that portion of the blood which is lacking or is functioning inadequately, such as erythrocytes in anemia, platelets in thrombopenia, thrombasthenia and hemophilia, and plasma in fibrinopenia or as a protein therapy. He thinks that by omitting the unnecessary substances it might occasionally be possible to avoid undesirable complications. He admits that this problem requires further biologic investigations.

Clinica Medica Italiana, Milan

67: 145-218 (March) 1936

Influence of Blood Transfusion on Velocity of Blood Circulation. A. Bertola.—p. 147.
Constitutional Hemolytic Splenomegaly with Increase of Maximal Globular Resistance and Ovalocytosis and Poikilocytosis: Case. M. Testolin.—p. 155.
Auriculoventricular, Interauricular and Emergency Heart Blocks Provoked by Means of Vagal Stimulation in Case of Elongation of PR Segment. A. Rubino.—p. 168.
*Amylase Reaction as New Method for Differentiating Exudates and Transudates. N. Fucci.—p. 176.
Sulfur Metabolism in Chronic Articular Diseases. S. Battistini, F. Quaglia and A. Robecchi.—p. 179.
Experimental Acute Hemorrhagic Pancreatitis. P. De Lucia and M. Torella.—p. 200.

Method for Differentiating Exudates from Transudates.—Fucci reports a test for differentiation of exudates and transudates. The technic is as follows: A decinormal solution of iodine in distilled water, a 1 per cent solution of sodium chloride in distilled water and, from this, a solution of 8.5 per thousand of sodium chloride are separately prepared. With the latter, eight solutions of soluble starch are made at 2, 1.75, 1.5, 1.25, 1, 0.75, 0.5 and 0.25 per thousand. Ten glass pipets are placed in a rack, the first eight of which are for the fluids to be examined; the other two are for controls. In each of the first eight pipets, 0.25 cc. of the unknown fluid is taken and in each of the last two (controls) 0.25 cc. of distilled water. Then 0.75 cc. of distilled water and 1 cc. of the 1 per cent solution of sodium chloride are added to each of the ten pipets. To the first eight pipets, 1 cc. of the different soluble starch solutions of the scale is added in their proper rotation. To the ninth and tenth pipets, 1 cc. of the 2 per thousand and of the 1 per thousand soluble starch solutions are added, respectively. The rack containing the pipets is placed in the incubator at 38 C. and left there for half an hour, after which it is taken out and the fluids in the pipets are allowed to cool in water or ice to the ambient temperature. Then three or

four drops of the decinormal iodine solution is added to each pipet and the reading is made. Fluids of inflammatory nature, such as pleural, peritoneal and synovial exudates, give either a yellow-whitish or golden color, which may be present in the eight first pipets or only in the last seven, with the first pipet showing a slight violet. Transudates, on the contrary, give a violet, which is more marked in the first five pipets, the last three giving a red violet. In the two control tubes, the typical violet, which indicates the starch reaction, is observed, being more marked in the first than in the second control tube, since the starch concentration in the former is larger than that in the latter. The test may be abbreviated by using seven pipets instead of ten; that is, five for the unknown fluids and two for control. The refinements of the technic are as follows: The mother sodium chloride solution should not be more than two days old. The iodine solution should not be more than twenty days old, provided it is kept in a cool place and in a colored container. The other solutions are prepared at the time of the test. The diluted fluids and starch solutions should be well mixed in the pipets before they are placed in the incubator. The contents of the pipets are well stirred after the iodine solution is added, but without disturbing the zone of initial transitory reaction. The color reading is made on the entire liquid column. The addition of a few more drops of iodine solution to the solutions in the tubes does not modify the results of the test but tends to clarify them.

Prensa Médica Argentina, Buenos Aires

23: 789-848 (March 25) 1936

Thoracoplasty: Finochietto's Technic for Paradoxal Incision. R. Finochietto.—p. 789.
Differential Sign of Passive Pulmonary Congestion. J. I. Sacón.—p. 793.
Multiple Peritoneal Hydatidosis: Case. F. Basch.—p. 795.
Gastro-Enterocolic Aerophagia in Infants. F. Ugarte.—p. 800.
Segmental Cesarean Section. S. Malamud.—p. 803.
*Disorders of Apparatus of Conduction in Rheumatic Heart Diseases in Children. J. C. Etcheves.—p. 820.

Disorders of Conduction Apparatus in Rheumatic Fever.—Etcheves made an electrocardiographic study on a group of thirty children suffering from rheumatic fever. He concludes that disorders of the conduction apparatus are frequent in heart diseases complicating rheumatic fever, both during the acute period of the fever and after its subsidence. They may be intra-auricular, auriculoventricular and intraventricular. Intra-auricular disturbances show themselves in the electrocardiogram by alterations in size and form of the P wave, which point to the existence of auricular hypertrophy complicating mitral stenosis and, sometimes also, mitral insufficiency. A P wave of low voltage in the three leads indicates diminished functional capacity of the auricle and, if it is of the broad type and appears in consecutive electrocardiograms, it indicates both the existence of auricular insufficiency and the proximity of fibrillation. Alterations of the P wave in several leads are of bad prognostic value. Simple incomplete and complete types of auriculoventricular block are frequent in the course of rheumatic heart diseases. Those of the simple type are the most frequent, especially during the periods of reactivation of the fever. The presence of auriculoventricular block in young patients suffering from fever of unknown etiology points to the rheumatic nature of the fever, while in patients suffering from rheumatic fever it indicates evolution of the infection. Its persistence after administration of intense salicylic treatment is of bad prognostic value. Disorders of intraventricular conduction show themselves in the electrocardiogram by alterations of the QRST complex, which may involve the QRS complex, the ST segment and the T wave or only a part of the complex (the bundle branch block). In the presence of disorders of the intraventricular conduction, the duration of the QRS complex slightly increases, the Q and S waves are rarely modified and the most important alterations are those of the R wave, which, if appearing in several leads in consecutive electrocardiograms, are of bad prognostic value. The modifications of the ST segment are numerous. Most frequently it is shortened and deviated above the iso-electric line. The modifications of the T wave are frequent. They predominate during the acute phase of the fever and may persist after its subsidence. An abnormal T wave repeatedly appearing in consecutive electrocardiograms is of a bad prognostic value, which becomes worse if alterations of either the P wave or the QRS complex coexist with it. Alterations of the PR wave and of the ST segment are the most frequent electrocardiographic abnormalities in the course of acute rheumatic heart disease in children. None of the disorders of the conductive apparatus, however, are pathognomonic of rheumatic fever. They all prove the involvement of the myocardium. Intraventricular disorders restricted to only a part of the conductive apparatus are those concerned in the cases of bundle branch block in which the left, but never the right, branch of the bundle of His is involved. The block of the left bundle branch is of a reserved prognosis, because it indicates the presence of grave intramyocardial and valvular lesions. The intensity of the alterations of the conductive apparatus shown by the electrocardiograms is, as a rule, in agreement with the clinical condition of the patient.

Klinische Wochenschrift, Berlin

15: 433-472 (March 28) 1936. Partial Index

*Histologic and Roentgenologic Observations on Internal Organs Five Years After Intravenous Injection of Thorium Dioxide Preparation in Dog. T. Naegeli and A. Lauche.—p. 436.
Studies on Electrophoresis with Choline Derivatives. H. Rutenbeck.—p. 437.
Clinical Statistics on Life Expectancy in Coronary Thrombosis. F. Kisch.—p. 440.
*Differentiation of Blood from Normal Persons and from Patients with Exophthalmic Goiter by Tadpole Experiment. L. György and B. Serény.—p. 443.
*Value of Plummer's Treatment as Preparation for Operation in Exophthalmic Goiter. E. Melchior.—p. 446.
Quantitative Determination of Indican Content of Serum by Means of Step Photometer. F. Böhm and G. Grüner.—p. 450.

Observations on Organs Years After Injection of Thorium Dioxide.—Naegeli and Lauche describe observations on the internal organs of a dog that was killed five years after a thorium dioxide preparation had been injected as a contrast medium. The roentgenogram, which was made shortly before the animal was killed, revealed that the density of the shadows of liver and spleen had considerably decreased (comparison with roentgenogram made two years previously). However, two new shadows, which were visible beside the vertebral column, were interpreted as lymph nodes. The histologic examination disclosed no thorium in the lungs, suprarenals, kidneys and pancreas. In the spleen, the cells containing thorium were found chiefly on the trabecular margins, and in the liver the traces of thorium were found chiefly near the capsule, whereas it had largely disappeared from the deeper layers. Some of the lymph nodes contained considerable amounts of thorium and had become necrotic; others contained only small amounts of thorium. The authors reach the conclusion that the thorium, which is first stored in the liver and spleen, gradually passes into the lymph nodes and causes necrosis. To be sure, the liver and spleen did not become impaired even after five years, but neither was there any sign of an elimination of the thorium from the organism. The authors repeat their warning against the use of this contrast medium, particularly in large quantities and in young persons, for they assume that the impairment of the regional lymph nodes can be expected also in human subjects.

Differentiation of the Blood of Normal Persons and of Patients with Exophthalmic Goiter.—After pointing out that Reid Hunt's acetonitrile test is not quite satisfactory for the differentiation of the blood of patients with exophthalmic goiter, because it is positive also in several other disorders, György and Serény describe their own observations in the tadpole experiment. They wanted to determine whether the action exerted by blood specimens on the metamorphosis of tadpoles would permit a differentiation of blood or urine of patients with exophthalmic goiter from normal blood or urine. In summarizing their observations they say that neither normal blood or urine nor the blood or urine from patients with exophthalmic goiter influences the metamorphosis of tadpoles. Thyroxine alone, as was known from former investigations, has a greatly stimulating effect on the metamorphosis. If thyroxine is combined with normal blood, the promoting action

on the metamorphosis is lessened; that is, the normal blood reduces the stimulating action of thyroxine. The same can be said of the blood of patients with exophthalmic goiter, except that its inhibiting action is somewhat less than that of normal blood. In some cases the differences were considerable while in others they were not, and so the authors conclude that, although generally in the tadpole experiment the inhibiting effect of normal blood on the thyroxine action is greater than that of the blood of patients with exophthalmic goiter, the difference is not sufficiently clear to permit a definite differentiation of blood specimens.

Value of Plummer's Preoperative Iodine Treatment.—In view of the fact that some surgeons still have a somewhat skeptical attitude toward Plummer's preoperative iodine treatment in exophthalmic goiter, and in order to prevent this from deterring others from employing this valuable method, Melchior describes his own favorable experiences. He employed Plummer's preoperative iodine treatment in sixty-four cases of exophthalmic goiter. He says that his cases were of the severe type. He advises rest in bed, a chiefly lactovegetarian diet and a quieting psychotherapeutic influence during the preoperative period. He begins the iodine medication as a rule by giving five drops of aqueous solution of iodine three times a day, gradually increasing the amount to three times fifteen drops or even more. To prevent auricular or ventricular fibrillation he resorts to quinidine, and in typical cardiac disturbances he gives digitalis and strophanthin preparations. Regarding the duration of the preoperative iodine treatment, he says that it cannot be definitely established at eight or ten days but may have to be continued for several weeks. The author emphasizes that Plummer's preoperative iodine treatment exerts a favorable influence on the surgical intervention as well as on the postoperative period. In cases in which the preoperative treatment had been adequate, he saw a threatening postoperative reaction only once. He also shows that Plummer's method permits operative treatment in cases in which otherwise it would be impossible.

Münchener medizinische Wochenschrift, Munich

83: 547-586 (April 3) 1936. Partial Index

Obstetrics in Home in Case of Premature Rupture of Bag of Waters at End of Pregnancy. C. Holtermann.—p. 547.
Impairment by Medicaments. A. Schittenhelm.—p. 552.
*Influenza Bacilli as Cause of Meningitis. Elisabeth Bender and H. Bruns.—p. 557.
*Treatment of Psoriasis with Extract of Adrenal Cortex. T. Grüneberg.—p. 561.
Protection Against Measles by Means of Placental Extract. G. Paschlau.—p. 564.

Influenza Bacilli as Cause of Meningitis.—Bender and Bruns point out that acute suppurating meningitis in its epidemic as well as in its sporadic form is most frequently caused by the meningococcus of Weichselbaum. Observations on 537 cases indicated that approximately 71 per cent were caused by the meningococcus, 10 per cent by the pneumococcus, about 6 per cent each by the tubercle bacillus, streptococcus and staphylococcus and slightly more than 1 per cent by the influenza bacillus. The authors report two cases of influenzal meningitis, in which repeated bacteriologic tests were made. As far as the clinical aspects were concerned, the cases presented nothing unusual, but the authors emphasize that every case of meningitis should be subjected to bacteriologic examination. They deplore that influenza bacilli are not always systematically searched for and stress that the cultures, which are made on blood-free mediums and are sterile after twenty-four hours, should be given particular attention. Moreover, discharges from the ears as well as the sputum should be examined. The two cases reported terminated fatally. The influenza bacillus causes one of the severest forms of meningitis, which, according to some reports, has a fatal outcome in about 92 per cent of the cases.

Extract of Adrenal Cortex in Treatment of Psoriasis.—After mentioning the experiences of other investigators with extract of the adrenal cortex in psoriasis, Grüneberg describes his observations. He gives subcutaneous or intramuscular injections with from 2 to 6 cc. of the cortex extract every day or every second day. The dosage is determined by the severity of the case and the duration of the treatment by the rapidity with which the results become manifest. As a rule, it is necessary to continue the treatment for at least five or six weeks. Some improvement is usually noticeable long before this time. The administration of the cortical extract is frequently inadequate for a complete cure and it is combined with local measures. The treatment is most effective in the form of psoriasis that is complicated by arthritic processes. The author thinks that it should always be tried in these cases. Generalized psoriasis likewise responds favorably to the adrenal cortex treatment. However, relapses are not prevented by this therapy, although prolonged treatment may have a certain aftereffect, particularly in the complicating articular processes.

Strahlentherapie, Berlin

55: 369-544 (March 21) 1936. Partial Index

Lympho-Epithelial Carcinoma. R. Baumann-Schenker.—p. 369.
Epicrisis of Irradiated Cervical Carcinomas. H. Hausding.—p. 387.
Investigations on Action of Roentgen Rays on Metabolism of Malignant Tumors. K. Inouye.—p. 409.
*Combined Treatment of Tonsillar Cancer. P. von Kisfaludy.—p. 429.
*Postoperative Irradiation of Cervical Cancer. F. Friedl.—p. 457.
Treatment of Incurable Carcinoma. J. Grode.—p. 462.
*Sensitization of Neoplasms Refractory to Roentgen Rays by Means of Short Waves. G. Fuchs.—p. 473.

Treatment of Tonsillar Cancer.—Von Kisfaludy considers radium therapy indispensable in the treatment of tonsillar cancers. He advises that the larding with radium needles be done by an experienced radiologist who has surgical knowledge. The needles he uses contain 3.3 or 6.6 mg. of radium element. Depending on the size of the tumor, he introduces from four to ten needles and leaves them in place for from twenty-four to thirty-six hours. He maintains that this method of application is superior to the former practice of using needles that contain only 1 or 2 mg. and that have to remain in the tissues for from five to eleven days. The shorter duration of the radium application reduces the secondary irradiation, the danger of tissue necrosis, of abscess and edema formation and of general infection or hemorrhage. Moreover, it is less annoying for the patient if the radium larding remains in place only for from twenty-four to thirty-six hours instead of for a number of days. The regional glands are treated with roentgen rays: 200 roentgens are applied from six to eight times. After six or eight weeks, the roentgen irradiations of the glands are repeated. However, if the glands are enlarged, they are excised and the surgical treatment is followed by irradiation. The results obtained with this combination method prove the advantage of the author's method of larding with radium needles.

Postoperative Irradiation of Cervical Cancer.—Friedl shows that opinions are divided as to the value of postoperative roentgen irradiations, and he decided to investigate the cases treated at his clinic in this respect. On the whole, he observed no decided advantage in the cases that had been subjected to postoperative roentgen irradiation. The permanent results were about 5 per cent better in the irradiated cases. He suggests that, in view of this slight improvement, it might be better to look for a method promising better results, and points out that postoperative treatment with radium seems to do this.

Sensitization of Neoplasms by Means of Short Waves.—Fuchs cites the various methods of sensitization of ray refractory tumors which have been tried in the course of recent years. He calls attention to the vasodilatory effect and to the induction of hyperemia by short wave treatment. He decided to utilize the hyperemia in order to increase the ray sensitivity of tumors. He followed Liebesny's so-called athermic method of short wave therapy, which utilizes chiefly the electric actions and excludes largely the heat effect. He resorted to sensitization in three cases of bronchial carcinoma and one case each of mammary and esophageal carcinoma. In order to obtain an adequate depth action he worked with an electrode skin distance of at least 10 cm. The wavelength was 15 meters, and the irradiations lasted twenty minutes. They were given daily and, after an interval of two or three hours they were followed by the roentgen irradiation. The latter was conducted according to the protracted fractional method of Coutard. At every session 200 roentgens was administered to one field. It was observed that the ray reaction of the skin induced by the Coutard irradiations was neither increased nor otherwise modi-

fied by the application of short waves. Moreover, the author emphasizes that in his method the combined short wave and roentgen therapy does not involve the danger of an increase in the malignancy of the tumor. He admits that his limited experience permits no definite evaluation of the value of the sensitizing short wave irradiations, but he considers their use justified in carcinomas that are refractory to ray treatment.

Zentralblatt für Gynäkologie, Leipzig

60: 785-848 (April 4) 1936

Studies on Amount of Corpus Luteum Hormone in Placenta. C. Ehrhardt and H. Fischer-Wasels.—p. 787.
*Gonadotropic Function of Anterior Lobe of Hypophysis During Menopause and Its Modification by Follicular Hormone. E. Engelhart and E. Tscherne.—p. 790.
Results of Treatment of Carcinoma of Corpus Uteri. R. Volbracht.—p. 796.
Acute Dilatations of Stomach Developing After Abdominal Operation. F. Palik.—p. 803.
*Pathogenesis of Congenital Dropsy of Fetus and Placenta. (Placental Villi and Uterine Mucus in Vein of Umbilical Cord). J. Czyżak.—p. 807.

Gonadotropic Function of Hypophysis During Menopause.—Engelhart and Tscherne point out that the gonadotropic hormones of the anterior lobe of the hypophysis cause cyclic changes in the ovaries and that the ovaries in turn act on the anterior hypophysis. After the ovarian function is abolished, typical histologic changes develop in the anterior hypophysis. It has been proved that the changes in the anterior hypophysis of castrated animals can be counteracted by the administration of estrogenic substance. The authors decided to investigate this problem in women. In studies on several menopausal women they found that the administration of estrogenic substance reduces or entirely abolishes the elimination of the follicle maturation hormone of the anterior hypophysis. These studies indicate an inhibiting influence of the estrogenic substance on the anterior lobe of the hypophysis. However, there is a morphologic difference in the hypophyses of menopausal and castrated women, for whereas that of menopausal women decreases in weight, that of castrated women increases, and whereas in the hypophysis of castrated women the eosinophil cells are increased, this increase is absent in menopausal women. These morphologic differences indicate functional differences; namely, a lack of the luteinization hormone in menopausal women.

Pathogenesis of Congenital Dropsy of Fetus.—Czyżak reports two cases of congenital dropsy of fetus and placenta. Microscopic sections of the fetal organs revealed everywhere foci of blood formation, which were especially numerous in the liver, kidneys and adrenals. The large, edematous placenta showed an abundance of connective tissue cells and a deficiency of blood vessels. The villi were larger than usual but consisted chiefly of connective tissue cells with few and small capillaries, the lumen of which seemed to be constricted by the proliferating connective tissue. They contained only few erythrocytes, many of which had nuclei. Some lumens were entirely empty. Moreover, some of the edematous villi contained no blood vessels. Examination of the blood of fetus and mother disclosed such a similarity that differentiation was impossible. A large number of nucleated cells were found among the erythrocytes. All stages of erythrocytic development were present. The blood picture of the mother returned to normal four days after delivery. The similarity between the fetal and maternal blood pictures was explained by the aspects of the sections of the umbilical cord. Many of the sections revealed villi in the vascular lumen and others showed portions of the uterine mucosa with glands. This shows that the normal barrier of the placenta had broken down so that corpuscular elements from the maternal circulation entered the fetal circulation, and vice versa. The author thinks that this abnormal circulation is the cause for the toxic action, which in the placenta resulted in proliferation of connective tissue, obliteration of the blood vessels and edema, and which in the fetus caused severe anemia, characteristic foci of blood formation in the internal organs and generalized dropsy. The author thinks that the defect in the placenta (breakdown of barrier between mother and fetus) is a factor in the pathogenesis of fetal and placental dropsy.

Voprosy Onkologii, Kharkov

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Problem of Gastritis and Its Relation to Ulcer and Cancer of Stomach. M. I. Lifshits.—p. 8.
*Gastritis. S. M. Katsnelson and V. V. Zorina.—p. 35.
Interrelationship of Gastritis and Gastric Duodenal Ulcer. M. O. Bakalchuk.—p. 59.
*Pathologic Alterations in Gastritis and Their Relation to Ulcer and Cancer. G. L. Derman and E. A. Dudkevich.—p. 77.
What Is Certain and What Is Doubtful in Pathogenesis and Etiology of Malignant Growths. N. N. Petrov.—p. 128.
Morphogeneity of Mammal Gland Cancer. B. Kooliabko.—p. 263.

Gastritis.—Katsnelson and Zorina studied 100 cases of gastritis which they classified on the basis of the character of the gastric secretion into normacid, hyperacid, subacid and anacid types. They used the Ewald-Boas test breakfast and a stomach tube to remove the contents. In addition to this method, the fractional determination after a beef tea breakfast was practiced in the anacid group. In the cases in which the fractional method failed to demonstrate free hydrochloric acid, 0.5 mg. of histamine was injected intracutaneously. The cases were studied roentgenologically with particular regard to the state of the mucosal contour. The following factors were found to play an important part in the etiology of exogenous gastritis: irregular meals, excessive condiments, too hot meals, alcoholism, smoking and certain drugs as well as vocational factors. In hematogenous gastritis an important part was played by the infectious diseases, cholecystitis, ulcer and carcinoma of the stomach, and circulatory and metabolic disturbances. The clinical picture of gastritis presented a multiplicity and a variety of symptoms, while that of a pure gastric ulcer was characterized by a scarcity of symptoms. All forms of chronic gastritis, the anacid in particular, may run a latent course without causing symptoms for a long time. The authors administered histamine in twenty-seven cases of anacid gastritis and observed an increase in the free hydrochloric acid (from 0 to 0.1 or 0.44) in only 19 per cent. The quantity of the gastric juice however was considerably increased. These results suggest the existence in their cases of a severe gastritis with profound anatomic alterations in the specific secretory glands. Clinical diagnosis of gastritis was not borne out by the roentgenologic investigation in 52 per cent of their cases. The authors conclude that roentenologic study of the mucosal relief is not of a decisive significance in the diagnosis of gastritis. The latter must depend on a careful consideration of all available diagnostic criteria.

Relation of Gastritis to Ulcer and Cancer.—Derman and Dudkevich studied 236 stomachs which had been resected because of an ulcerative or carcinomatous lesion. In their material chronic ulcers were localized most frequently in the pyloric portion of the stomach and along the gastric channel. Ulcerative and carcinomatous lesions of the stomach frequently exhibited inflammatory exudative manifestations in the form of an infiltration of the mucosal and the deeper layers of the wall of the stomach with neutrophils, eosinophils, lymphoid cells and plasma cells. A gradual diminution of the inflammatory reaction was noted the farther the area studied was removed from the ulcerative or cancerous lesion. The authors are inclined to consider these inflammatory manifestations secondary and complicating lesions rather than primary and the cause of an ulcer or cancer.

Hospitalstidende, Copenhagen

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Changes in Electrocardiogram in Oxygen Deficiency. K. Larsen.—p. 277.
Ureter Transplantation, Especially in Exstrophy of Bladder. S. A. Hanssen.—p. 285.
*Investigations on Sulfatemia in Kidney Diseases. E. Øllgaard.—p. 292.

Sulfatemia in Kidney Disease.—Øllgaard says that, while there is normally from 0.79 to 1.50 mg. of sulfur per hundred cubic centimeters as sulfate in the blood serum, in uremia the amount may rise to 16 mg. The retention of sulfates is on the whole parallel with the urea retention but seems to exceed it in milder degrees of insufficiency and is assumed to contribute not inconsiderably to the acidosis in uremia.